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ABSTRACT

These proceedings present three opening speeches, eight presentations, and a summary of the presentations from a 3-day conference at which distance teaching practitioners from selected institutions shared their experiences. The opening address (Alister McIntyre) is followed by a speech (Dennis Irvine) that discusses the Commonwealth of Learning, an organization set up to promote cooperation between institutions using distance education and applying communication technologies to education. The main address (Carlyle Dunkley) focuses on the potential and impact of using distance education for teacher training and professional upgrading. The following presentations describe the organization, impact, and likely developments of the distance teaching programs of eight institutions: "The University of the West Indies Teaching Experiment" (Gerald Lalor); "Distance Education at Memorial University of Newfoundland" (Erin Keough); "Distance Teaching at the University of Otago" (Penny Love); "The Philosophy and Role of Teleconferencing in Distance Education" (Claire Matthewson); "Distance Education at Laurentian University" (Gerard La Freniere); "Teaching by Distance at the University of Waterloo" (Christopher Knapper); "Presentation on the Open University" (Judith Calder); and "Computer-Based Learning at Nova University" (Barry Centini). Other contents are "Issues and Problems Identified in the Presentations" (Dennis Irvine), conclusion, and participant list. (YLB)

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# EXPERIENCES IN DISTANCE EDUCATION

Report of a Conference sponsored jointly by

**The Commonwealth of Learning**
**&**
**The University of the West Indies**

Kingston, Jamaica
14-16 July 1990

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The University of the West Indies and the Commonwealth of Learning acknowledge with thanks the support of the Overseas Development Agency in funding the participation of the representatives from the Open University, England, and the Ministry of Education, British Virgin Islands.

We should also like to thank Nova University for sponsoring the participation of Dr.Barry Centini.

# INTRODUCTION

Distance teaching in its various forms has grown in importance and scope. Several institutions now exist with the prime purpose of delivering educational programmes at a distance, while other traditional universities and colleges are expanding their facilities to offer distance teaching courses.

One indication of the importance of distance education is the establishment of the Commonwealth of Learning, an organization recently set up to promote cooperation between institutions making use of the potential offered by distance education and by the application of communication technologies to education.

The University of the West Indies Distance Teaching Experiment (UWIDITE) is the distance teaching arm of the University of the West Indies (UWI) - a regional institution serving fourteen English-speaking[1] Caribbean countries. UWIDITE provides a telecommunication network for nine[2] of the fourteen countries which is used for interactive distance teaching and other types of teleconferences. It has been operational for nearly eight years and is now on the verge of expansion, not only in terms of the number of sites in the network but also in the areas of programme planning and production, and technology.

In order to prepare for these developments, UWIDITE and the Commonwealth of Learning co-sponsored a conference on distance education held at the UWI Mona Campus in Jamaica, July 14-16, 1990. The conference brought together distance teaching practitioners from selected institutions and Caribbean persons likely to play a key role in an expanded distance teaching operation in the region.

The aims of the conference were:

- To share experiences of various institutions of distance teaching and explore mechanisms which are likely to enhance the quality of distance education.

- To familiarize a cross-section of the Caribbean to different aspects of distance teaching, such as programme planning and design, including assessment of students at a distance, and distance teaching technologies.

- To provide information to help the UWI community assess the climate and trends for the proposed expansion of the network and further development of distance teaching.

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1 Antigua & Barbuda, The Bahamas, Barbados, Belize, British Virgin Islands, Cayman Islands, Dominica, Grenada, Jamaica, Montserrat, St. Kitts-Nevis, Saint Lucia, St. Vincent & the Grenadines, Trinidad & Tobago.

2 Antigua, Barbados, Dominica, Grenada, Jamaica, St. Kitts, St. Lucia, St. Vincent, Trinidad.

Its expected outcomes were:

1. Establishment of new, and the strengthening of existing links between the UWI and institutions participating in the conference.

2. Information inputs to assist UWI in the planning and organization of its distance teaching programmes.

3. Publication of a Report of the proceedings.

**PRESENTATIONS**

During the three day conference presentations (followed by discussions) were given on the organization, impact and likely developments of the distance teaching programmes of the following institutions:

Laurentian University, Canada
Memorial University of Newfoundland, Canada
Nova University, USA
Open University, England
University of Otago, New Zealand
University of the South Pacific
University of Waterloo, Canada
University of the West Indies

**PARTICIPANTS**

The participants in the conference were members of the University community, the Ministries of Education in the supporting countries and Guyana, and regional organizations which utilize the UWIDITE network.

## OPENING CEREMONY

*Left to right: UWI Pro-Vice-Chancellor, Gerald Lalor; UWI Vice-Chancellor, Alister McIntyre; Jamaica's Minister of Education, Senator the Honourable Carlyle Dunkley; COL Programme Director, Dr. Dennis Irvine.*

The Opening Ceremony was chaired by the Vice Chancellor of the UWI, Mr. Alister McIntyre, who welcomed participants and made remarks on behalf of the UWI. Dr. Dennis Irvine, Director, Caribbean Programmes and Materials Acquisition and Development, Commonwealth of Learning, spoke on behalf of his institution. The Minister of Education of Jamaica, Senator the Honourable Carlyle Dunkley, delivered the main address.

Reproduced on the following pages are the speeches made at the opening ceremony.

## Speech by Mr. Alister McIntyre, Vice-Chancellor, University of the West Indies

It is a very auspicious occasion for us of the University of the West Indies to bring together in one meeting place so many practitioners of distance education. This meeting is taking place at a very timely moment.

It comes when we are in the terminal phases of preparing the University's development plan for the 1990's, in which outreach activity and distance education related to that represent a central element in our plans for the decade. We are projecting a very substantial increase in our off-campus enrolments, similar increases in continuing education and, above all, a new relationship with tertiary level institutions in the region which we hope the technology of distance education will help to develop.

For all of these reasons, I am very pleased that this conference is taking place and that we have managed, Minister, despite your busy schedule, to get you to come here this morning to speak to us.

May I also take the opportunity of expressing the University's gratification that the Commonwealth of Learning is collaborating with us in this particular conference. When the Commonwealth of Learning was established, we felt the loss of two distinguished West Indians, Dr. James Maraj and Dr. Dennis Irvine. But it is a very happy circumstance to find that, notwithstanding their very onerous responsibilities, they manage to spare some time for work in the Caribbean, and I wish to extend a very warm welcome to Dr. Irvine and to tell him how pleased we are to have him collaborating with us once again.

I would like to mention here what the management arrangements will be for distance education in the University, with effect from the first of August. In order to ensure the fullest possible mobilization of the University's resources for distance education, I have asked two Pro-Vice-Chancellors to assume responsibility for the management of distance education.

Professor Gerald Lalor will continue to be responsible for the technology aspects, namely the management and development of UWIDITE as a system of technology; and Professor Rex Nettleford will be responsible for the programme aspects, involving the mobilization of faculty resources for the preparation and delivery of distance education programmes. Of course, both of these Pro-Vice-Chancellors will work in close collaboration with the Principals of the campuses who are themselves responsible for the programmes being offered through their campuses.

We hope that this network of management arrangements will serve to support a vastly expanded programme of distance education in the University.

Well, ladies and gentlemen, it is not my intention to make a long speech. One of the pleasant features of this conference is that there seems to be an absence of documentation, and I hope that this will lead to a very fruitful exchange of views among all of you.

**Speech by Dr. Dennis Irvine, Director, Caribbean Programmes and Materials Acquisition and Development**
**The Commonwealth of Learning**

Let me first say on behalf of the Commonwealth of Learning how gratified we are to be co-sponsoring this conference on distance education. It is a measure of the immense importance we attach to cooperation with this University, and of our recognition of its potential to assist us in discharging our mandate in the region to promote the development of human resources through the application of distance teaching techniques and technologies, that despite budgetary constraints and the fact that a case could be made by some, present company excluded of course, that we were already over-subscribed in the Caribbean relative to other parts of the Commonwealth, our President readily agreed to make some funds available. He has asked me to convey his warmest greetings to participants, and his best wishes for a successful outcome of the conference.

As this is the first event in the region with which the Commonwealth of Learning is associated, and I use the word 'event' advisedly since we are already involved in quite a few initiatives at the national level, a few words about the agency are clearly in order. And, if the terminology sounds strange and it looks as though I am talking about an advertising company, the word 'agency' is taken strictly from the memorandum of understanding and I am simply quoting chapter and verse.

I shall not bore you with the history of our establishment. Suffice it to say, that COL, as we have become known, was born largely out of a concern to find a solution to the problem of access by overseas students to higher education in their traditional places of study - chiefly the United Kingdom and Canada - a problem brought on by the decision of the United Kingdom followed by the other developed countries of the Commonwealth to charge economic fees for overseas students.

The experience of Britain, Canada, Australia, New Zealand and India, to cite the most notable examples, had in the meantime demonstrated the potential of distance education to expand access. And attention soon turned to the possibility of Commonwealth cooperation in this field as a possible answer to the problem. By the time the idea was fleshed out by two expert groups - one under Lord Briggs, the other under John Daniel (formerly president of Laurentian University and currently Vice-Chancellor of the Open University) - the Commonwealth of Learning had evolved into an agency with a wider and much more challenging mandate: that of promoting and facilitating the use of distance education techniques and technologies to address human resource development needs.

It is important to emphasize, therefore, that COL is not just about higher education nor is it confined territorially to the education sector.

The memorandum of understanding establishing COL in September 1988 specifies eleven functions of the agency - not all, it is true, clearly separable. We have subsumed most of these under five broad areas within which activities will be concentrated, and they are: information services; materials acquisition and development; communications technology; training; and continuing professional education. These are our first priorities, and as much as we are able to cope with given our present resources - human and financial. We expect to add in the near future: research and evaluation, and student support services.

Let me say a very few words about each of these, and illustrate with some projects we are in the process of developing or implementing to give you a better understanding of our role.

In the area of materials acquisition and development we are expected to facilitate access by institutions in developing countries to materials developed mainly in the developed countries. We have already begun to make courses available on a large scale, for instance, to the University of Mauritius from Laurentian University; and to Papua New Guinea from the New Zealand correspondence school. We have negotiated terms and are about to make available to institutions accountancy programmes derived from both the CGA and the ACCA to be used as the basis of a degree in accountancy for those institutions so interested. We have sent out samples of various course materials to a vast number of countries, both for inspection purposes and to use as a model, as well as to serve as references.

In the case of course developments, we have initiated work in the fields of environment and women in development where we have been charged by our board to take a specific interest. And we are in the process of starting some work on marine resources management.

In regard to communications technology, the Federal Department of Communications in Canada gave us a specific grant to assist institutions in improving their communications capabilities for distance education, and to establish inter-institutional links. We are currently about to embark on a project in Guyana which will link the headquarters of the Institute of Adult and Continuing Education in Georgetown to its three study centres in the country, both through radio and teleconferencing; and we are doing the same in the Solomons. We have managed to link up a number of regional study centres in India simply through the provision of facsimile machines.

In the communications technology area, we are covering the entire spectrum of technologies from the simplest, broadcasting, to the most complicated, satellite technology.

In training, we are focusing on training in course writing, in course editing, in materials adaptation, in producing audio programmes and broadcasting material, as

well as television programmes and videos. We have started in Southern Africa and the South Pacific, with the cooperation of the Australian Aid Agency, in conducting training programmes there. We are about to begin courses in the Caribbean; in Guyana later this year, and for the region as a whole a course on materials adaptation sometime in October, hopefully in Barbados with the kind cooperation of the Cave Hill Campus of the University of the West Indies.

In the area of continuing professional education we have begun to explore ways of working with the Commonwealth professional associations in continuing legal education, in the health sciences, and in engineering in the first instance. And, we hope as one of the outcomes of that programme to have (and I was just speaking to Dr. Liverpool about this) a programme in continuing legal education involving the University of the South Pacific and the University of the West Indies in a link of some kind.

This is a somewhat hasty introduction to COL. It has to be because time does not permit me to talk about it at any length. Let me now, if I am not exceeding the bounds of your patience nor abusing the privilege of being allowed to speak, make one or two quick observations relevant to this conference.

In the introduction to "Higher Education into the 1990's", a publication by the Society for Research in Higher Education and the Open University, Sir Christopher Ball has this to say about the trend in higher education in the U.K.:

> *"the beginning of the 20th century saw the marginalization of Oxford and Cambridge, when it became apparent that they could not provide the expansion then required. It now looks increasingly possible that the end of the century will see a similar marginalization of the traditional university system, leaving the task of expansion to the Open University, the polytechnics and the colleges of higher education."*

Sir Christopher's remarks, which are not necessarily confined to the U.K., need to be seen in the context of the speed, unparalleled in the history of education, with which distance education has evolved over the past two decades. The University of the West Indies may perhaps not be as vulnerable to marginalization, but I believe if it ignores two realities it does so at its peril. The first is the relatively low proportion of the population enrolled in higher education in the Caribbean. In 1984, the figure was 6% in Jamaica and 4% in Trinidad & Tobago, which is to be compared with anything between 12 - 37% for other middle and low income countries. The Caribbean figures are unlikely to have changed significantly since, while there is a fair chance that the comparative figures may have lengthened. A large part of the problem is related to the middle segment of the Caribbean education system (taking the University as the apex and primary/secondary schooling as the base), which the Bourne report describes as being "too slim". The impact of a shortage of middle level skills is felt in all countries, but perhaps nowhere more than in the so-called LDC's.

The second reality is the growing internationalization of education made possible by distance education, and the obvious implications of this for national institutions. National institutions in the Caribbean for one reason or another have always had to compete with conventional overseas institutions for students, although the competition declined somewhat when the traditional places of study within the Commonwealth, the U.K. and Canada, introduced economic fees for overseas students. In certain fields of study such as accounting and banking, to cite two striking examples, the numbers reading for an overseas qualification have, of course, always been significant. But with the continued rapid expansion of distance education, and with overseas institutions vying to expand enrolment for reasons of financial viability if nothing else, one can anticipate a lot more off-shore registrations in years to come. This will either be a good or a bad thing, depending on whether it complements the efforts of a country's or the region's educational institutions to address manpower needs, which we at COL are supposed to facilitate, or on the other hand competes with them, a situation which we may be powerless to prevent.

So this conference is perhaps timely, and I know the hope is that it will help to stimulate the diversification and expansion of distance education in UWI as something both necessary and desirable. Participants have been carefully chosen with this objective in view, and the expectation is that there will be an 'opening' of the mind. Diehard believers in face to face education are not so easy to convert however. It is like the man who is convinced he is dead and will not be convinced by any amount of argument. Eventually he is asked, "Do dead men bleed?" He pauses and considers the matter and agrees that dead men do not bleed. Whereupon a pin is produced, the thumb is pricked, and a small amount of blood spurts out. "There you are," he is told, "you are not dead". The man looks with amazement at his thumb and eventually exclaims, "Good Lord, dead men do bleed!"

With the compliments of COL, you will be hearing from distance education experts in a short while from now, so I think I can safely excuse myself from labouring to say something intelligent on the subject. It is perhaps worth observing even so that UWI has a good opportunity to address innovatively the issue of greater access to higher education in the Caribbean through moving towards converting itself into a dual mode institution, offering in the first instance high quality cost-effective distance education programmes to carefully targeted groups of students. The dual mode has its strengths. Courses of the same standard as the conventional face-to-face can be developed more easily; students have greater access to tutors; and there is continuous feedback. Great care has to be taken, however, that the system is not abused, and the notion has to be dispelled from the outset that adopting the dual mode delivery system is a cheap way of expanding educational opportunities.

This is not only because distance education requires good learning materials, and that these are costly to produce. Good learning materials are a necessary but not a sufficient condition for successful distance education. Student support services of quality are critical. I like to think of conventional face-to-face teaching and distance

learning as two ends of a continuum. Good conventional teaching is learner centred and requires learning resources in support. This includes handout materials, audiovisual aids, distance learning modules and computer-based training packages, and so on. At the other end, one starts with the learning resources, but to make distance learning effective one needs to provide student support, to overcome student isolation and to enlarge the opportunities for interaction between teacher and learner, as well as between learners themselves. Viewed in this light, distance education may be seen as almost the extension of really good conventional teaching, and universities can make of its necessity a certain element of virtue.

I see I am in danger of doing what I said I would not, speaking about a subject in which, as I was at pains to tell you, there are experts in the audience. It reminds me of the story of the old man whose proudest experience was that he was one of the few to survive the famous Johnstown flood. He was a good soul, apart from his harmless compulsion to tell every listener his tale. Eventually he died and found his way to heaven. After interviewing him and declaring his papers in order, St. Peter asked if he had any particular request. "Yes, I'd like to tell some people about my experiences surviving that Pennsylvanian flood in 1889." "We'll see," said St. Peter. After a while he returned and said, "We have it arranged. You are expected to speak on Cloud 'C' this afternoon." "That's wonderful," said the Johnstowner. "But just one thing," said St. Peter, "I just want to warn you that also in the audience will be Noah."

Allow me in closing to say once again how pleased we are to be supporting this conference. We see it as the start of a continuing and fruitful relationship between the University and COL, as we strive towards the common objective of addressing the human resource development needs of the Caribbean.

## Main Address by Senator the Honourable Carlyle Dunkley, Minister of Education, Jamaica

It is indeed a pleasure to be associated with this exercise this morning. I must confess to a host of emotions since, when I was based at the University, I had the very good opportunity of taking part in UWIDITE-presented programmes. I therefore speak as an "old boy".

The first thing I feel obliged to do is to place on record our appreciation of the work that Professor Lalor and "his merry band" at UWIDITE have done. I know analogies about candles are a little risky these days, but it is fair to say that instead of cursing the darkness they did light the candle. And that has meant so much to our University offerings.

I would also like to say that I have noted with interest, Mr. Vice-Chancellor, the new arrangements for the delivery of UWIDITE programmes, and I know it is going to play a very important part in the ten-year development plan of the University to which you made reference in your opening remarks. For I think it is common ground that, if the University is to be able to implement its thrust in science and technology, attention has to be paid to a number of issues simultaneously. I would like to emphasize the link with the lower levels of the educational system which eventually feed into the tertiary system.

The certificates that are offered through UWIDITE, and especially the Certificates in Education, represent one means of using distance education to upgrade the teachers practising in the classrooms. And for this reason, it is with great anticipation that I look forward to a consolidation of developments in this particular area of teacher training and professional upgrading.

We recognize the need, and I know that Professor Lalor is, therefore, very anxious to consolidate the intra-Jamaica network, as an adjunct to UWIDITE, which will enable through the power of communications a number of programmes to reach our teachers in the rural areas of Jamaica. This is particularly important given our context of scarcity, because even if you are upgrading and you have to put the additional pressure of relocating the individuals out of the classroom for however good a reason, you have created yet another problem as you strive for a solution.

I would therefore like to broaden my presentation to share with you some thoughts that we have been having in this area of the potential and impact of using distance education for teacher training and professional upgrading.

Earlier this year, a team from the Commonwealth of Learning on the one hand, and a number of my colleagues in the Ministry of Education and other professionals in

the field got together with a view to examine that particular issue. And we are indebted to the Commonwealth of Learning for a survey document entitled "Distance Education and Educational Reform in Jamaica: The Clock is Ticking". Through this medium, the government and the Ministry have got a sense of the possibility of working closely together with the Commonwealth of Learning on some of the Ministry's training programmes.

That team consisted of Dr. Irvine, Professor James Greig, and Dr. Elsa Willebrands. They met with members of the leadership in the Ministry. My colleague Burchell Whiteman led the discussions on our behalf. We shared with the team a number of programme priorities. And it was the consensus that through distance education we can accelerate post certificate programmes for teachers as an immediate priority.

We have also set our eyes firmly on the medium as one of the principal modalities for on-going and structured in-service professional development and renewal. And, I am happy to say, that these priority areas have drawn a receptive response from the COL team.

Now, as Dr. Irvine mentioned in his remarks, the medium offers great possibilities against the backdrop of countries either lacking in resources or experiencing shortfalls in teacher supply. And we feel that they are particularly well geared to assist us in accelerating - I have to emphasize that - accelerating some of our strategies.

They have informed us, and Dr. Irvine mentioned a number of companion developments, that they do have a range of distance education material already prepared and designed for teachers of science, mathematics and language arts. And therefore, by extension, considerable time, expertise and resources which they have already expended can be adjusted suitably to our conditions. We therefore intend to access some of these materials for our own programmes. They have also indicated that they could make available expertise for training persons in writing and developing materials and programmes for distance education.

What was also discussed was the possibility of our Canadian colleagues at TV Ontario providing us with some audio-visual materials, as well as training in video production and use. Further, the North York School Board of Education has indicated a willingness to give assistance in the areas of mathematics, science and language arts in teacher development programmes.

So, generally speaking, what has emerged is that we can access a number of important variables that will affect our delivery. And I therefore wish to indicate clearly that we are going to pursue these areas of collaboration between the Ministry and the Commonwealth of Learning and, also, to interface with our own UWIDITE system here at Mona in this vital area of teacher training and professional upgrading.

I thought I would also share with you that in a recent publication, Money Index, there was a contribution by one of our information technology managers, Ken Sylvester, who made a comment about technology innovation vis-a-vis the changing global economy. And his point was that the technology innovations we see today are definitely not innovations waiting for a problem; instead they are innovations in response to a constantly changing global economy, where economic survival has become the preoccupation of governments and captains of industries around the globe.

In such a fast changing environment, most of the technology innovations in the lab are geared firstly to facilitate governments and enterprises in key business talks where issues of supporting critical mission activities are involved; secondly, as a strategic weapon in achieving competitive advantage; thirdly, as a key instrument in the defense of boundaries, markets, and also in terms of product differentiation; and finally as a means to facilitate and manage change, and to be alive and sensitive to issues of quality enforcement. So we see then that we have to put things in context, in terms of what is happening in the broad economy and the potential that the application of technology can have as we come to maintain our place in the marketplace.

I should now like to reflect briefly on the question of the individual and distance education. Through this means the individual has a range of choices to select or elect what suits him or her best from institutions which have taken on much greater variety and flexibility. And all of this is made possible through the advances in communication worldwide, and through the new information technology generally.

The establishment of a Commonwealth of Learning at Vancouver, with an Information Centre in Britain, illustrates the point, as also do plans for strengthening a Commonwealth network of inter-related universities and colleges overseas. And here I would like to take time out to pay tribute to what the Commonwealth of Learning has already achieved in terms of its broad conceptual framework and the potentials which it seeks to highlight. Already we can see many instances of institutional consolidation.

But back to the individual. The individual is able to choose a wide range of courses from a variety of standpoints and within many different modes. For example, should it be full-time, should it be part-time, should it be elementary courses, should it be for certification, or for general individual development and advancement? Post graduate courses can also be taken at home for general interest and for formal qualifications of a variety of kinds. And, we see too that individuals can focus on their specialty almost in terms of specific modules.

So there are a host of options that emerge and which, therefore, empower persons in a very real sense to choose what they really need and want. This is very important, because we do know that individuals have sometimes been obliged to come off the

education train for reasons of domestic circumstance. Distance education enables them to resume their journey on that train at a convenient time. It is therefore very flexible and can be tailored to individual concerns.

It is against all this background, and of the increments of achievement already realized here at our own University, that I am trying to highlight the potential that this medium does offer. From my own experience of UWIDITE, as I made mention, I was sometimes obliged to wait because some lecturers overran their time. That enabled me to get a better perspective of what was going on. I heard our colleagues in medicine, for instance, having conferences about different public health matters. I have also had the good fortune, and I see Mr. Leslie from the ILO/Caribbean Labour Administration Centre, of being involved with an offering for the benefit of factory inspectors and conciliators.

So already we in the West Indies do have a background of experience, and the challenge for us is to consolidate that. It is against this background, Sir, that I again say that it is very, very pleasurable to be associated with this initiative.

## The University of the West Indies Distance Teaching Experiment UWIDITE)
## by UWIDITE Director, Pro-Vice-Chancellor Gerald Lalor

Let me say my own welcome. I had no idea when we first spoke about this conference that it would turn out to be such a large gathering; but the numbers just seemed to grow. And I felt rather pleased that some of my colleagues were accusing of us of meaness by not inviting them, and saying that they would have been willing to stay over in Jamaica for the extra few days and not at our expense. I offered them invitations there and then, but I think most of them had made other commitments which they just couldn't get out of.

I think it goes to show that the idea of distance teaching is catching on in the University. And I thought it might be useful, just to give some idea of how UWIDITE came about, and then to say a little bit more along the lines of what the Vice-Chancellor was saying and then to talk about the role that UWIDITE might play as one of the development arms of the University through this decade. I think that might meet with the approval of most people.

I received the Gleaner (daily newspaper) award some years ago on behalf of UWIDITE as an educational system that was likely to make a great contribution to UWI. In the way we have in the Caribbean, I think this came rather early - just a couple of years after UWIDITE had started. But as I was receiving that award and speaking at that function, it really impressed itself on me on how fortuitous things are - how things happen frequently without any planning, without any real control. Sometimes they just happen.

**Beginnings of UWIDITE**

UWIDITE came about really, I would think, because my daughter was, in the 70's, working with U.S.AID in Kingston. U.S.AID had a problem because they had promised to demonstrate database retrieval and they could find no one to help them with it, no where to hold it, or anything like that. And being a good daughter, she thought her daddy could solve any problem - particularly other people's, I guess. They asked me if we could do it for them, so we did.

It was a very successful demonstration of Dialog; there were some social events and I got to meet, in particular, Cliff Block - who if you don't know and you are interested in distance learning and getting money from America, you should get to know.

After a couple of months or so passed, NASA found that they had a satellite that they didn't have too much to do with and wondered if anybody in the Caribbean could use it for a programme of some sort, mostly as a demonstration. So Cliff phoned me and I always say "yes". But I made it clear to him that we had no money; that they would have to give us the engineering capability and everything that was necessary to do it. They said, "Fine".

The first thing they did, was to send out some engineers to the Caribbean to look to see whether they could see the satellite or not. This was a beautiful bird - now defunct - called ATS6. A very powerful unit. They came to Jamaica. That was fine. They went to Trinidad. Geographically that was fine; politically it didn't work out. They went to Barbados and said that was impossible, because the look angle was two or three degrees above the horizon and the signal would not be acceptable.

And, I am making a point here, because what is acceptable to one man might not be acceptable to another. They said Barbados just couldn't work, but like that ram who hits his head against the dam. I said, "Let's try it". They said, "It can't work. If it rains, you won't see it. If a ship passes, you won't see it". But remembering the quality of our television in the Caribbean at that time, I was heartened to think that we would be able to see something. So they put a dish in. They looked at the horizon from Cave Hill, and they saw it. I don't know about the quality compared to Barbados television, but certainly the quality I saw in Barbados was better than our Jamaica television at that time.

Next we needed permission from the governments to mount this experiment. I wrote to the Minister of Communications in Jamaica. I didn't get an answer. I phoned him. I got a huffy little letter to say, "My ministry does not deal with things like this. Contact the Post Office, and please be advised that you will have to pay a fee of $3.00". Well, that was O.K.

In Barbados, the Ministry did deal with it. We didn't have to pay a fee. But, we had to make a telephone call to the Prime Minister. So that worked.

Trinidad just didn't work at all. We got in between the Minister of Education and the Minister of Security. And when the Minister of Education started talking about security with our then Vice-Chancellor (I can tell the story now that he is not with us), he reminded the Minister of Education that his business was education and not security; and he only wanted to hear him talking about education, and he felt he should fight the battle for education. But it went on and on, and we just never got an answer from Trinidad.

So we thought since the University's Chancellor was Governor General of St. Lucia there was a certain nexus that made St. Lucia an appropriate place.
I tell this story at some length because I want to emphasize that nothing in the Caribbean, and I don't think in any country, is as simple as it seems at first. To move any innovation forward, there is an awful lot of ground work which has to be done; and I'll touch on that a little bit when I come back to UWIDITE itself.

Even in the University here the whole thing was considered a bit of a joke - I am always amused. I remember my Dean of Medicine saying, "Professor Lalor and his E.T. stuff". E.T. was then on. People just didn't see the type of contribution that this could make to education in the Caribbean. One person asked me, "how are you setting up a telephone system connecting Trinidad, and I can't get a telephone to phone from my office to my home?" A good argument, but irrelevant.

We called the experiment "Project Satellite", and it ran for two months. We had a splendid opening ceremony - ambassadors for so all over the place, speeches coming out of the TV screen - oh, a really splendid thing. I think that opening ceremony served a very good purpose: it started to show people that maybe there was something to this. Maybe you could talk to an image on a TV screen and it could reply to you, and maybe the whole thing did make sense.

We put on a whole range of programmes because we wanted to get a feeling for whether the thing might work; and if so, if it worked, what sorts of things would capture public imagination, and so on?

Had we knew we were getting somewhere when at the end of two months members of staff started asking if we could extend the TV for another month. Well, we couldn't. I am a great operator at the margin, and this was really at the margin. People were sleeping in my office. They went to bed - well on the sofa - at two in the morning after writing the TV script, because in those days it wasn't so safe to be driving motor cars in Kingston at that hour. And they would get up at six. To start at ten the next morning; went home to have a shower and breakfast, coming back in the hope that power would be working and the TV would be on, and so forth.

By the end of that two-month period you had one tired bunch of people. And I can't speak about the early days of Project Satellite without mentioning Alma Mock Yen who slept many nights on the floor in my office. And the other people, like Tony Walling and Keith Manison, who gave remarkable technical support. We thought you could just jump on the air and put on a TV programme. Well, we did it - for two months. And despite all sorts of requests we just couldn't do it any more. But, it had taught us that here was something that could be very powerful indeed.

So we started looking for money. Well, U.S.AID gave us some money for a feasibility study. We went to the Open University and several other places to get a feeling for the type of distance teaching they were doing and how we might adapt it.

In the end we came to the view that we wanted an interactive system. Of course we would have loved television but it didn't take too long to realize that we just couldn't afford that. The main reason for our decision to be interactive was because it was very clear to us how lonely the professional can be in an isolated community; how lonely the doctors, and the engineers, and the whole range of people - the teachers and so on - really were; how much they wanted to talk. They were quite happy to listen; but they wanted to talk too because they had points of view to get across.

We felt that the same thing would happen with our younger clientele: the university people in Dominica, the British Virgin Islands and Montserrat (I call those two because they haven't got sites yet), and Belize, the Bahamas, and all over the place. But we also noted that the demand in Jamaica, in Trinidad, and in Barbados could swamp anything that the smaller territories needed because Jamaica is half the population, Trinidad has half that of Jamaica, Barbados has maybe half that of Trinidad.

We had to do a bit of a balancing act here to ensure ... I don't know how to put this, I can't say those who need it most, because that is not true on a numerical basis; but let me say...that those who would find it most difficult to receive an alternative mode of instruction got their fair share. And off we went.

We charged into these things, got hold of Christine (who applied for some job for which I was chairing the selection board and promptly told her that wasn't her job - wait for me outside), and we were very fortunate to get her, grabbed hold of Vilma, and so on. And we banged off with UWIDITE.

**UWIDITE at Present**

UWIDITE is largely a telephone based system using, I think, every telephone technology that is in use. It has its satellite link; it uses tropospheric scatter; it uses microwaves, high frequency modes and land lines. Some links I think are, if not now will shortly be, on optical fibre.

We now have some nine stations - well nine countries, say. We are hoping for more in Jamaica, another one in San Fernando, Trinidad, and one in Tobago (which will give three in Trinidad and Tobago). We had a splendid application in with Nova University for some beautiful satellite technology, but I gather that U.S.AID is not going to fund that in the present version; and Barry Centini and I will have to get our heads together to get some other money for it.

UWIDITE means University of the West Indies Distance Teaching Experiment. We were looking for an acronym and we thought it went quite nicely with "erudite". Some people feel that it is an established system and we should find another word for "experiment", but to me we are just starting to scratch the potential of what can be done by this type of telecommunications network. And, of course, one hopes that we will continue to attract the more innovative types of people who will be able to contribute - not just to the technology or the programming - but to the whole ethos of getting out there to do service.

As of now we can say UWIDITE has very successfully completed its first phase of operations. We are now moving to consolidate. We have won over the telecommunications carriers, even as far north as Newfoundland; we have won over Cable and Wireless, and the local international carriers too, to the extent where they are even giving us discounts and cash to buy equipment.

We are now trying to improve the quality of the equipment we are using, the training of our people, and our programmes. We are planning to, and we have some money - not a lot - to upgrade our facilities.

We are improving Trinidad in particular. Montesrrat and the British Virgin Islands are next.

UWIDITE has reached a stage where, you could say, it is an accepted arm of the University and it should follow the normal university development path, which can be slow. But, we thought that wasn't the way for the future of UWIDITE. We thought (when I say "we" now I mean all of our people that our Vice-Chancellor is pleased to call his management committee) that here was something which could be used to carry out some of the University's dreams for the development in this decade and into the next.

**Future Plans**

For a small region there seems to be something about the Caribbean that helps turn out some very very bright people. It would seem a pity if the potential of these people were just wasted. It would be more than a pity, I think, because they are bright enough that if they cannot get the things they want they are going to take them. If we educators cannot help to develop the Caribbean region, our children are going to have a hard time living here. Because, although we have not been noted in recent times for strong, physical revolutionary tendencies, one can go back to some of the slave rebellions - people like the Maroons in Jamaica - to figure that we can be an obstreperous people.

In addition to all the "goody goody" things that people think about when we talk about education, we must realize that it is in our own interest, even for our own physical safety, to have this region socialized and educated to an extent where people

have a reasonable chance of having their own dreams come true - of eating well, and maybe driving a motor car, or a couple of TV sets somewhere in the neighbourhood, and things like that.

In this business of education, and particularly in university education, I think enlightened self-interest has to go hand-in-hand with the theory, the philosophy, that a university in a developing country is an agent of development.

The University has put together a ten-year plan which although very ambitious is not large enough. It is ambitious in the sense that it is going to be difficult to meet the goals; but the goals in fact are modest. They aim not quite at doubling the number of students in the Caribbean. We have 12,000 students in the University - we have just made the 12,000 - with a regional population of over 5 million excluding Guyana. The percentage of our labour force that is trained is really small. Some people say 1%; let me say under 2% trained at the graduate level. The figures you get on illiteracy don't tell the whole story because, certainly in Jamaica, we are not really a literate population in the sense that there is no point handing most people a set of instructions and saying "Go learn to use that machine".

Now in the telecommunications area, although you need your skills - and I would never for one moment suggest that even the people who are using the microphone shouldn't have some general idea of what is going on - telecommunications is one area in which the whole world seems to be able to share. There is money in it. That's what I hear from Cable and Wireless and Bell. It is in the company's interest to get the maximum use of telecommunications.

During the closing years of the last decade, enormous telecommunications capabilities and capacities have been put in place. The newer satellites and the optical fibre capabilities are going to open up all sorts of telecommunications possibilities. A vehicle exists which, at the present rate of projection, will have more capacity than users; and the educators of the world have more users than capacity. So, I think there is a significant opportunity to use one technology that is racing far ahead of many, and where the costs are surprisingly cheap, when you think of the alternatives and possible benefits. Therefore, in our development plan for this decade we want to make maximum use of telecommunications to cut down on costs, to deliver better programmes to more people.

This University is expected to become the hub of the educational system in the Caribbean. We are going to be a part of the driving force for education in the other tertiary colleges, in the secondary system, in the primary system, and also in continuing education. This is going to put an enormous responsibility on the staff and leaders of this University, and on people like Carlyle Dunkley over there who, as Minister of Education, has the same urgency for the progress of Jamaicans. How can we contribure?

UWIDITE is only one aspect of our thinking, though a major one and the only one that I need say anything further about. We see the Caribbean linked with telecommunications, so that the programmes which are developed in the University of the West Indies, or by any other institution in that is willing to work with us, can be made available to large numbers of people.

We see these telecommunication networks also as giving an opportunity for professionals to interact. Medicine is one that has been using the network to very good effect; and, in fact, I was very pleased to learn that our surgeons in Barbados were able to help the surgeons at Memorial University with a procedure for stomach aneurysms, which was more economical in money, blood and patient time than they were doing in Newfoundland. This is the sort of thing which makes you realize that human contact, in this way, can make a very great difference both to people and to institutions.

The plan for UWIDITE is to do the best we can with the best technology which is available to us. We hope we will be able to use small satellite stations where, for one reason or the other, it is difficult to include a particular country. We hope to take advantage of the new optical fibre links which are being put down in the Eastern Caribbean. We hope to improve our audio programmes, our written material and, finally, our use of computers.

**Potential and Constraints**

I believe that despite the fact that computer-aided instruction has not been as successful in many countries as was promised earlier, the computer can be a most powerful teaching tool. It can be used for academic administration; it can be used for assessing the errors which students make as they go ahead through any particular programme; and simulation today is so powerful that it is just mind boggling.

The problem of laboratory teaching for distance students can, to some extent, be overcome. If the simulation is good enough, the person can almost feel as though he is carrying out the experiment. He can make mistakes, the computer can correct him and lead him through the next steps.

With optical disks any library can now be made available; paintings in the national galleries in any part of the world can be shown to students of history, art, and anything else without their having to leave their countries. I know this has disadvantages, but, what is the alternative?

There is available to us in the Caribbean a technology, and this may be one of the areas in which UWI will become pre-eminent among the distance teaching institutions in the world.

We are going to need money. We are also going to need assistance - the type of assistance which comes from battling people over coffee or over rum - or people coming to help us to look at things, or our staff going to look at things to try to sort out what is best for ourselves. We are going to need to train a whole new cadre of young people. We are going to have to convince a whole lot of older people who are fixed in their ways.

**Conclusions**

If UWIDITE is to become just one of the routine tools of the University of the West Indies, I think I have already done my job, and it would be easy enough to hand over to other people. But if UWIDITE is to be seen through the remainder of this decade as a pioneer in education, as something which aims to bring better education than is available to more and more people, then I think our work is just beginning. And I am sure that the discussions which we will have, and the interactions which will take place over the next couple of days will help us all to get a handle on the type of perspective which is most appropriate to realizing the dreams which so many of us have.

## Distance Education at Memorial University of Newfoundland
## by Ms. Erin Keough, Co-Director, Health Sciences Centre

I can see why I have been invited along here today, aside from Professor Lalor's usual gracious hospitality in allowing me to come down to these lovely, warm countries from my northern climate. I think perhaps our University is set along a path probably quite similar to that which is going to be taken by the University of the West Indies. We have a similar type of application. Despite the fact that we look fairly well off to some countries, by Canadian standards Newfoundland as a Province is probably trying to address some of the same socioeconomic problems that are being addressed here as well.

I propose in my chat today to give you a little background by telling you where I come from and what we do. And then I am going to talk a little bit about some of the general issues of education that all distance educators have to address. Dr. Irvine seemed to touch on a lot of them in his opening remarks. During the next couple of days I am sure you are going to find that the seven or eight of us who are here as presenters address the same concerns in different kinds of ways. So I am not going to talk in any fashion about the right or wrong, or address any of those kinds of issues. I am simply going to relate how we address our problems as a group at Memorial University.

**Memorial University Teleconference Network**

To start, then, let me tell you a little bit about what we are. Like UWIDITE, we are an audio-graphic, teleconferencing network. I come from a unit that has the unlikely name in distance education of "Telemedicine". We started our history trying to address some of the very professional development issues that Professor Lalor was talking about with isolated professionals in the Province.

Our network started with 13 sites. We now have 160. Like UWIDITE we started with one single, dedicated, audio network. By September, we will have seven regional circuits. These circuits can be mixed and matched as the programme requires. There are two circuits in the eastern end of our Province, two in the centre, two in the west, and one in our northern region.

In addition to our dedicated facilities, we also have a dial access facility with 16 incoming lines. These dial access telephone lines can be added into our dedicated conferences as needs be. We have some sites that have an educational requirement, but do not have the use pattern that warrants them being on a dedicated facility. We also use our dial access equipment for bringing other resource people into our programmes, and for joining ourselves to other networks, such as the University of the West Indies, for shared programming.

As I mentioned earlier, we are an audio-graphic network. Our principal audio-graphic tool in the education arena is the telewriter. Many of you are probably familiar with the unit. For those who may not be, it is a combination of hardware and software that turns an MS DOS computer into an interactive long distance blackboard. And because it is an MS DOS computer, in addition to free-hand capacity, you can also have a graphics component.

Unlike the University of the West Indies, our geographical coverage is large. We have 150,000 square miles of space, and a total of about a half a million people spread in communities here, there and everywhere. The capital itself has only 120,000 people. Our sites range down to community sizes of maybe only 200 people. Also, unlike the West Indies, we have a miserable, awful winter -- as in most of Canada. Some of our sites are in locations that are reached only by boat or helicopter.

Geography and economics dictated an audio-type teleconferencing network, as opposed to some of the other kinds of distance education technologies that work in other situations. Our network of sites is overseen by coordinators who are not tutors. They are strictly administrators.

**Distance Education set-up at Memorial University**

Telemedicine's role in the distance education framework of the University is that of designing and delivering the audio-based activities. The University has a School of Continuing Studies and Extension. The Division of Continuing Studies and the Division of Educational Technology provide the other distance components to the university environment.

Educational Technology has a very sophisticated video production plant: a studio, editing suites, cameramen, graphic artists,etc. On the other side of the School of Continuing Studies, there is the administrative group that identifies the faculty, liaises with the faculty chairmen, puts all the courses in the field, and has a field staff to support these activities.

The teleconferencing network, which is the principal functional unit of the Telemedicine division, is actually a user consortium. The university is one very significant player in that consortium. However, there is the whole medical field from nurses, doctors, food service workers, to ambulance drivers. We also support the community college activities, distance high school activities in the Province, and a number of other institutions in the education field.

**Teleconference Programmes**

To give you some idea, last year the teleconferencing network carried 4500 hours of programmes. About 40% of our programming is health related. About half of what the health people do is teaching, and that comes directly through our unit; another 30% of what they do is concerned with activities of an administrative kind - the Department of Health perhaps meeting with some of its field staff, the Hospital Association updating people, labour negotiations, things of that nature. Only about 20% of what the health people do is actually patient care, and is primarily related to transmission of medical data. It is in the health arena that we use slow scan television for transmission of X-rays. And there are other areas of audio-graphic medical data transmission that I won't go into here.

Roughly 60% of what we do is actually in distance education for general distance teaching groups. The University pretty well occupies our network from 4 o'clock in the evening until 10 o'clock at night. There is an increasing high school programme, spearheaded by the Department of Education. We have, as you can imagine with a very small and scattered population, a number of very small, rural high schools in which it is very difficult to get an advanced high school curriculum that, in turn, allows those students to enter the post-secondary institutions. We have completed the development of the high school Math programme and we have now started the development of Physics and French -- aiming at having the five core courses required for University entrance in a distance mode.

Other groups include the Marine Institute, which does a significant amount of programming for those involved in marine occupations, primarily those related to fishing.

With the emphasis these days on literacy and functional literacy, we have started cooperating with our community colleges in the production of a distance delivery literacy training programme for tutors of literacy. We have also just completed a pilot on what is referred to at home as adult basic education, which is in reality grades 7, 8 and 9 science and math for people who would have perhaps left their formal education before they should have; and now with an increasing orientation towards computer-based technology - the information age - need to have more skills in that area and certainly want to acquire more formal qualifications.

**Distance Education at Memorial University**

In the ideal world then, we consider ourselves to be a multi-media group. I think in the university setting the backdrop, or the backbone of what we do is in print. It is supported in varying degrees by teleconferencing. Some university courses have a significant teleconference component of one and one-half hours a week. Some, which are more like a correspondence course, have perhaps only four interactive

sessions during the year, which are not compulsory. We like to say that we pick the best medium to get the message across.

Like everyone else we are also subject to the usual constraints. Costs, always a factor; availability of instructors in a dual mode institution (you certainly don't want to be in the position of having to rob Peter to pay Paul to get your distance education programmes delivered); political situations - it remains a struggle to convince everybody that distance education is not a second class approach, and that you can indeed get an entire university degree off campus. Our University has not yet accepted the fact that one can do a complete degree off campus. At this point in time you have to have at least the equivalent of two summer school sessions on one of the University campuses. And there are also other political situations related to the need to provide education sometimes a bit faster than perhaps we might like to.

**History of Distance Education at Memorial**

So this is where we stand. How we got there perhaps might shed a little light on something that Dr. Irvine asked me to do, which was to try and respond to the sort of questions that might be of interest to people namely, "What kinds of problems have you had, and what did you do to resolve them?"

The University started its life in distance education in the mid 60's because of a need to upgrade teachers. Some of our teachers were practising without university degrees. So we started, because it seemed the closest thing to a classroom, with video-tape production. We had eight community learning centres around the Province supplied with resource materials. And the teachers came in, and actually took the courses by video.

What we found was, of course, that the cost of production meant that we couldn't do as many courses as were required at the time. So, very soon after the mid-'60's we developed a fairly significant correspondence section. And that allowed us to increase our community learning centres from 8 to 45.

In addition to the other kinds of resources that were based in the centres - books, VCR equipment, etc. - there was a tutor assigned to each centre. That tutor would have been someone who had completed a degree, but was not a Ph.D.

We had a fair bit of attrition. The turn-around time problems which everybody faces were difficult; and they were particularly difficult in the winter and in some of our more remote centres. We also had a bit of conflict, we found, between the tutors and the primary instructor at the University, because the tutor was probably playing a slightly larger role than the instructor had hoped.

So we, like the University of the West Indies, were in the field early enough that when the Canadian government was looking for someone to do something so silly as

to use satellites in the use of distance education, we became involved in what was known as the Hermes satellite trials. That trial was one-way video, and two-way audio.

It was fairly extensively evaluated by an outside team. We discovered, yet again, that real time - particularly broadcast video - was not a mechanism that we were going to be able to support in the long run for such a small population. We will frequently have 20 or 30 students in a class. We are not up into the 100's that make broadcast video a viable possibility.

We also discovered that really 95% of what we could or wanted to do, could be done with supplemented audio; so we adopted the audio system as a primary delivery mode outside of print. What it gave us was an immediacy of interaction. And, it was certainly very well received - both by the instructors and by the students. It allowed us to give guidance, administrative support, logistical support to students who were not easily accessed by other means.

In the mid 80's, moving on from an increase in print and audio type of courses, the telewriter came on to the scene. We had been having trouble getting from courses that were easily print-based to courses like math, business, science, research methods. And the arrival of an interactive blackboard certainly facilitated programming in that area.

We have come back round to the scenario of using video tapes also as a supplement to the basically print and audio-based programmes. We use video fairly sparingly. We use it, for instance, for a chemistry lab demonstration or a demonstration of some physics' principles.

With the advent of desk-top publishing life in the print arena became a lot simpler, and we were able to broaden the scope of things we could do because of the increased speed with which we could update or revise our manuals and get them in the field. The situation today is that we have a home-based package that goes out to the student, with a shrink wrapped, three-hole punched manual that would tell her or him how to work through the course. The student has assignments, problems, probably some additional information over and above the textbook, a set of instructions on how to relate to the video tape. If she is in a science course, say, information about what to do with her home-based lab kit, - all the usual kinds of things for a print manual.

The manual, the video tape, lab kits, and anything else relevant go off in a package to the students. They can pace themselves to a certain extent. Depending on the type of course they are either going to be regulated by the teleconference sessions that happen once a week, or if they tend to opt more for the correspondence-based course, they are regulated only by themselves.

We have been unable to get very far in the use of computer conferencing. Part of the reason is undoubtedly the lack of familiarity with computers in the rural settings which characterize our environment. We had a hard enough time, I have to tell you, introducing the telewriters - simple as the function of the telewriter is - into our sites. There are also other factors, certain people who have computers don't have modems; so the University probably would have to make a significant input into the provision of modems. And it is really only recently that we have had universal access to Datapac which makes computer interaction a reasonable and viable alternative.

So, again I would like to say that we have tried to make reasonable and sensible choices about how to confront things. But, I think like many distance education groups, the type of network or the type of delivery that one decides upon is weighted heavily by ones client group, its needs, what facilities are available, and what are the problems to be overcome.

**Institutional Considerations**

One of the things I want to talk a little about before I get into some of the ways that we tackle the various issues related to the students and the professors, are some of the needs of the institution. They have to some extent, I think, been already addressed already by Professor Lalor in his opening remarks to this session.

Our University had to decide, (and the University of the West Indies is also obviously deciding), what should be its stand with respect to the general government directions in education. We are probably about three steps further along the path here in moving from what was in essence a university-based unit, through cooperating with the community colleges and other post-secondary agencies; and, in the last few years, having gotten that far with the Department of Education saying, "Well, you know, we have all of these high school needs; and what are you going to do to help us? You are the best distance education thing we have in the Province right at the moment; so how do you propose to relate to the secondary system?"

I think that this is a fairly significant step for any university, because it does have implications for your budget, for your staff, for what you are going to be able to do with a unit like, say, UWIDITE. Now from a certain perspective, being a dual mode university and having a separate unit, as ours is, that deals with distance education will really facilitate any motion in that direction, because the unit can become a design, production and delivery system. It can relate to any set of content people that it wishes to. There is the university group, or there is the high school group which comes with a curriculum it wishes to be changed to a distance format.

Within our own University, so that we could legitimize what we were actually doing, our distance education group has been given a new designation. It is known as "TETRA". Its mandate is indeed to broaden what we do to include activities outside the basic university delivery.

One of the biggest institutional needs to be addressed with respect to universities, and any educational agency, is the maintenance of academic standards. I think the concern that quality education can be delivered at a distance is becoming increasingly less with the acceptance of distance techniques. Again, as the Professor implied earlier, in a dual mode institution sometimes this is easier, because from the perspective of the University the same courses are taught on campus as off, as is certainly the case in our University. They have to be approved by Senate, the same teachers are used, the same examinations are sat. The problem, of course, is to find the faculty to do it. Our preference is to have distance education programmes prepared, designed, and delivered as extra load for which the faculty is paid for the delivery and the development. This is done in two separate stages, because the development is on a sliding scale depending upon how much production is actually involved.

The other institutional worry of a university, or certainly where we come from, is the lack of library facilities. We use books of readings and readings in manuals. We maintain a certain level of library facilities in our regional centres. We also have a mechanism called "Libline" which is not toll free but is not an expense to the student, which gives access to our principal libraries on the campuses. The campus library has a distance education group that deals with the needs of the distance education students.

I think with respect to the institution, in all fairness to a group like UWIDITE (and obviously great steps are being made along the path here), if the system is expected to support other than university groups a lot of internal policy decisions are needed to make this possible. Even to address the needs of adult learners at the university level, universities, I think, need to address the issue of interdisciplinary degrees, because people already working quite often do not want to be put into the mode "You are going to be physicists at the end or chemists at the end." And that, I feel, is a significant challenge for many universities.

The other thing is to resign yourself to the fact that, if you are going to save money on buildings, then you had best budget for a good delivery mechanism - whatever it is going to be in the end.

Having briefly discussed institutional needs, let me now turn to the general issues of distance education. Again, as I mentioned, you are going to hear these over and over, I am sure, during the next few days. I am simply going to tell you how we address some of them.

**Student Support**

One of them, referred to by Dr. Irvine earlier today, is the issue of student support. If you do not have adequate student support, you are not going to have students. It may not be quite as critical here yet; I am not that quite sure. But I do know that if

we do not provide adequate student support, our students are going to be taking their courses from the University of Waterloo, or the University of Athabasca, or any of the other agencies that offer university credit courses.

The key to student support is knowing your client and what kind of environment that client is coming from. In Newfoundland (and, again, I think it has contributed significantly to the fact that the primary delivery base is print and audio-teleconferencing), we have a very oral culture. People like to sit around and chat; and that sort of mechanism of learning is very entrenched in our culture. It is also a mechanism that is accepted by the University as one of its means of developing the kinds of cognitive skills that university people want to develop in their clients. The latter are, as we all know these days, not so much interested in acquiring factual information as in the actual development of critical awareness - which is an ongoing concern of all universities. There are other significant ways of doing this; but as I said this is one use of an audio medium - an interactive audio medium is the one that we have chosen.

I think we all need to be particularly aware, which is certainly our experience, of people's socioeconomic conditions. Sometimes it is more important to get people out of their homes and into a group situation. It gives them peer support because, quite frequently, people are studying when other people in their family probably think it is not all that important or necessary; or they are playing a role in their family that mitigates against being able to go off quietly into a room and study. We certainly have had our students support the notion of "the group" at teleconference sites. They like the group dynamic; they like being able to discuss things with their peers; and they also like being able to get together and discuss concepts before they actually go on teleconference programmes.

Equally important, I think, to knowing your client is knowing your own short and long-term mandate. Our short-term mandate when we started was health and university education. But we always knew long-term that we were going to have to provide services to a wide range of educational levels and probably a wide range of literacy levels. We also knew our mandate was not specifically to address the needs of our larger urban regions. It was to make the centralized resources of our educational and health institutions available to rural areas. So again, that was part of the reason for selection of the delivery kind of medium that we have.

As I said, the University started in distance education because of a need to upgrade teachers. We now support a very broad range of activities, and we sit in that range of activities as a distance support team. Whether that is to a university faculty person or to the Department of Education, is irrelevant to us.

What we have found in trying to achieve that kind of base support for all educational activities in the province, is that we really do need to make use of all the infrastructures that are out there by way of human resources. We do have

teleconference coordinators at our sites. But, we pay liberal call upon the adult education teams that happen to be in any of our communities - the extension field workers, the field workers for the Marine Institute. Wherever we can lay our hands on somebody who is vaguely related to education, they are pulled into the net. And I think there is a provincial push through the government to make sure that net meshes together and supports all distance learning as far as we can see it.

We have found that as technology has improved and become more accessible, we can perhaps do with less support people in the field. Because we can deliver things to people's home, we no longer have to have community learning centres equipped with VCR's and what have you. Certainly in Newfoundland, the use of a video tape at home has become a very simple thing. The University used to have continuing studies coordinators in every town. We now only have regional officers. We have a fairly simple method of relating between ourselves at the central delivery site and the regional teams.

For university level students we offer a specific support mechanism and an academic counselling centre. Students have access to it on certain nights of the week by distance means, primarily the telephone. From the technology end, because unlike your system our students are expected to walk in and turn on all the equipment and get it set up, sit down and use it, we provide on-air briefing sessions during their first night of class. They are provided with a video tape at the sites on the equipment's use. We rewrite any manuals that come in, because we have found that what is produced by groups such as computer companies is totally unintelligible to anybody who hasn't already got a degree in computer programming - including myself, I hasten to point out. We also keep little sets of quick pointers of what to do if you get into trouble.

On our network, operators monitor programmes at all times so that if any specific sites do get in trouble, they have someone whom they can turn to.

Administratively, the University has field officers in the regions served. All students are provided with manuals which include work activities and community resource lists. And, as I mentioned before, they do have access to library facilities.

We periodically conduct a survey of students for changes that they would like to see in the support mechanisms. A general reply is usually, "more, please". And, like all universities, we only have a certain capacity to respond to that, but we do try the best we can. And we, of course, obviously use the audio teleconferencing network as part of the support mechanism for our students to provide guidance, updating, clarification, etc.

**Management and Staffing**

One of the other items that we were asked to talk a little bit about was management and staffing of networks such as this. I think the best thing that you can have in the management of real time network is, once you have established your plan, to make sure you have a contingency plan. And maybe you should have your contingency plan before you have your plan.

Again, to support our students, we tape all of our programmes. They can be replayed at some point prior to the next class should some technical misfortune hit a site. We use our dial access capacity to give access to students whose sites may be in trouble on our dedicated network. And of course for the print component there are always couriers, if we get in trouble, and fax machines.

Our one word of warning to faculty is not to make our contingency plan their plan. We can be quite nasty to people who don't get their stuff in on time. However, you have to have updates. University courses are like that. Things change. God help the people who were trying to do current Canadian history in the past few months who wrote their course in September 1989 quite conscientiously.

We have found that the one thing that keeps a real time system that does not have a lot of field technical support going, is simple lines of communication - both in-house and also from the field back to the centre.

We have also found that it is absolutely essential to keep all of our equipment uniform. It is a great joke amongst the providers at home that when this great communications network calls to look for more computers, we are not the least bit interested in how large the hard disk is. We just want to know, "Is the status light in the top right-hand corner, and is it green?" Because, when we issue a set of instructions on the network, we don't want to have to say, "Well, your status light might be green. It might be on the bottom; it might be on the top; it might be yellow; or it might be blue; but you have got to find it. You have got to push this button. It could be here or it could be there." This is not the workable scenario in a network that has 10-20 sites on at one time and one hour to get a programme done. An instructor that has an hour of information to get through does not want to spend 10-15 minutes sorting out technical problems.

As to the staffing we find necessary for the level of programmes we carry, this can be divided into three components. There is the network delivery group. And, under that group we have a coordination staff - both centrally and in our sites. We have an operational and technical staff. We replace any equipment that goes faulty. We do not let it be repaired in the field because what happens, of course, is that repairs are done differently and you are back into the "where is the status light" problem. We provide operators on all our programmes because there is absolutely no flexibility in our programme time limits. If you are on at 9 and off 10, you cannot be off at 10

minutes after 10. There is already another programme waiting. We have an instructional design group that helps the instructors from the point of view of the audio type of design. And we have an administrative group, affectionately referred to by the other staff as "work generators" and having no other useful function I can assure you.

On the University's production side, we have all the staff that goes with a television production studio: several cameramen, several editing technicians, a maintenance crew, graphics people, and producers.

In the real time administration side of things, the University has a whole selection of people who process the materials, get courses into the field, line up invigilators, book sites, book rooms, all that kind of activity.

So, as you can see, not only do we divide from the point of production and delivery, but also production and real-time because the people who are involved in production in print or in video tape are in a different time and space than those of us who are rushing along trying to get the programme on at 9 o'clock. And, I think from the perspective of the university instructor that is easier to contend with.

**Technology**

Just a word or two on technology before I move on from student to instructor support. To stress once again, the need (I think) from the point of view of both the instructors and the learners to have all the technology as uniform as possible. The other primary tenet that we have found in operating a real time interactive network is to maintain a credible working relationship with your common carriers. If your common carriers - your telephone company, your satellite company, your whomever else - find that people are calling in and reporting troubles that are not really the concern of the carrier, they are not going to pay any attention to you.

I am not going to say a lot about technology because certainly I have chatted a lot, or we have chatted a lot, with the UWIDITE group on these items. I think from the perspective of faculty and other people who are going to be involved in production of courses or deciding where universities are going, it is important not to be dazzled by the technology itself. It is very easy to view technology as something other than a means to an end. The trick is to define what you need to do, and what are the basic kinds of things that you need to bring to that agenda to do it. Despite the fact that we do use different types of technology, as I mentioned before, our primary carriers are print and audio. Anything else that we add, enhances that mix. And we certainly approach any of our course meetings with our faculty from that perspective.

Technology cannot be too foreign either to your students. As I have said, we have had trouble introducing the telewriters. Needless to say, it needs to be accessible and

reliable. If you have a nice sophisticated technology that doesn't work, again you will have no students at the end of the year.

**Instructor Support**

Another issue of concern to all distance educators is how much instructor support can you give to those poor souls that you are trying to get to produce courses for you. Again, I come from a dual mode university. We are seen as a support team to the instructor. The instructor himself or the faculty is seen as the content expert, the content provider. We are involved in process and delivery, not in decisions on content.

So to that end, we begin work with an instructor, once the faculty has agreed to do a course, with a course meeting in which the instructor meets the production staff and the administrative staff and he or she is walked through the various media that would be at his or her disposal. We go through some of the issues that he or she needs to be concerned with - such as copyright clearance and how long that takes, and what they may or may not be able to use in course manuals.

At that time, the instructor is assigned an instructional design person or producer, depending on the type of course, and that person becomes his or her contact with the distance education team - in the general round of trying to keep things fairly simple. Our particular distance education group has about 50 people in it; and you really don't want to be trying to fish through the various components trying to figure out who does what.

Once they are finished with that course meeting, the instructors are "turned over" to the audio people for a briefing in delivery techniques, and how to use the telewriter, and what the telewriter can be used for - those kinds of activities. They are introduced to people like graphic artists, proof readers, desk-top publishing people so that they will get a flavour for what can be done.

They are also given a book, which is affectionately referred to as "a manual on manuals", but is in essence a guide to the preparation of undergraduate distance education courses. In this wonderful book everything you ever wanted to know to be a distance education instructor is contained, including what to put in your manual for your students. That becomes the instructor's Bible, that and his contact person with the production team.

For "training the trainer" in real-time, on-air delivery techniques, we tend to operate on a one-on-one basis with our instructors, again working through what their course is, suggesting the delivery techniques that might best serve their needs. This is a face-to-face session. However, if our instructors are not at the principal campus we brief them utilizing the network.

About one month into the actual delivery of a course, the instructional design person from the audio group contacts the instructor again, sees how he or she is making out, goes over areas that may have been forgotten or may have developed since the course actually 'went live'. Instructors are obviously encouraged to come back and forth as often as they see fit. We do very little actual language training for use on a network. Instructors are pretty much left to their own designs, although we do have a little package that was put out called, I think, "Listening for the Ear", which instructors quite enjoy.

The administrative support is very similar to the kinds of things that are produced here at the University of the West Indies, to which I have referred already.

**Course Design**

Another area that is obviously of concern is course design. Again this is not the day for a great dissertation on instructional designs. I think I will tell you a little bit about how we select our courses. Being ever practical, we try to pick courses that are going to have some longevity; that an instructor is going to be able to teach for a number of terms. In our situation, the copyright for a course is held by the instructor, not by the institution. So it is important to us that the course stay with us for a few terms. Some instructors are very flexible about letting other instructors use their manuals, providing access to the material; but the copyright is held by the instructor. Again, I think that has arisen from the fact that we are a dual mode institution, as opposed to a single mode distance education type institution that has a different type of orientation. We try, obviously, to select courses that reflect the strength of the University, because for us that is going to have more long-term application.

Our regional officers keep in touch about where our clientele are sited, what courses they have finished towards the completion of their degrees, what courses are still needed in the field, so that we can have a feeling for what we should be trying to develop next. This also gives us a feeling for what are popular courses. Right now, the most popular courses and the most in-demand courses are business - various business courses at all levels. In Canada, it has been decided that the entry level for the nursing profession will be a BN by the year 2000, so right at the moment university level nursing courses are in great demand in all areas of the country. We try to repeat our courses at regular intervals so that people at various stages of getting their degrees can have access at appropriate times.

What are some of the instructional issues? I think many of us working in dual mode institutions have spent a lot of time with instructors, getting them used to the idea that preparation is intense and early. I mean, they have a production team hounding them a year in advance. They are trying to deliver Business 2800 to their class, and at the same time develop it for a different medium to be offered a year hence. First-time distance education instructors also need to be familiar with the needs of an adult learner, as opposed to the more traditional learner that they have been dealing

with - the 18 to 25 year-old who has never been out of a university or formal education setting.

One issue that we have had to address, and I have mentioned I think briefly already, is the lack of library facilities in areas outside of our urban areas. And I have already mentioned briefly some of the ways that we have tried to tackle it.

The other thing that we certainly encourage our instructors to do, is to be more conscious of developing critical awareness skills by methods other than going to a library to compare different types of papers. This is dictated by a fact of life. The libraries are just not there. So, we encourage them to engage their students in what we are pleased to call "action research". Send them out to a hospital. Send them into a business. Send them to interview other professionals in the field. Do their class presentation on the real life versus the book of readings - that kind of thing. And, I think for the most part, we find that a fairly successful mechanism. In the students' manuals, we try to list resources that are available in their regions - professional resources, whatever libraries happen to be available, where the nearest hospital is, all the kinds of things that they may find as useful resources in some of their research.

Again in course design, we try (and I am sure everybody does in his own way) to be particularly aware of the environment from which our students are coming. Different social needs require different course designs. And if you are addressing a rural clientele you are obviously going to approach a course design much differently from the way you might do it in a more urban setting.

We encourage our instructors to maximize the use of technology while minimizing the cost of production. "Think small" is our motto. We use print where we can. Teleconferencing is obviously used for the strength of the interaction. Audio tapes we use on a very limited scale, (and you will hear a lot more about audio tapes from other people) mostly for mastery skills like French labs, or that kind of thing. Video is used when it is important and the telewriter for a common visual space.

**Evaluation**

Linked to instructional objectives, which for us hopefully are the same on- and off-campus, is the whole issue of evaluation, of which I must point out we do not do enough. I will state that as a leader to my other comments. I mentioned before that our off-campus students are evaluated by the same exam as that given on campus. They are required to do similar numbers of assignments, problems, etc.; so we try to maintain a comparable kind of evaluation from that perspective.

With respect to how we evaluate what we do (always an interesting topic), I don't think I have brought it up here, but we maintain a small question bank that can be used for evaluation of short series. Instructors can select from the database the kinds of questions that they would like to see answered about their course. Their selection

is printed off as a questionnaire and is made available in whatever package they would be using as their support package.

The continuing professional education groups administer very open-ended kinds of evaluations: what would you like to see done? how would you like to see it changed? - not very structured things at all.

The first presentations of university courses are almost considered pilots. This is not to say that they are not well developed; but we know that the minute they go into the field, they are going to have to be changed. So, we certainly brace ourselves for a considerable revision of any course after its first run through.

Major new areas of development are usually assessed by an outside evaluation team. We have just recently put half of our first year university programmes into a distance mode. In recent years our vocational schools became community colleges. So there needed to be a change in orientation from more vocational kinds of activities to more academic kinds of courses. Along with that, there needed to be a more universal first year. To support these initiatives the University has developed 1/2 of its first year academic programmes for distance delivery. This is being offered right now in two locations and is also being assessed by an outside team. They are looking at marks, assignments, success rates. They are also looking at many life factors as they relate to the University. Going to a university is not just study and books. There are all sorts of social factors. So these kinds of issues are being looked at. The students' perceptions of their relationship to their professors; the students perception of their relationship to the University; their ability to make friends; and so on.

Interestingly, half-way through the first year another programme recently evaluated was the high school programme. These students, again being a much younger clientele than we were used to dealing with, gave us no end of worry. The students were given a readiness examination. They were compared to an urban group and a rural group that were doing the same level. In our first year of delivery, the same teacher taught both face-to-face and on the system. So marks were compared. And, fortunately for us, yet again the distance education students shone! We had some formative things that went on along the way. We increased the amount of telewriter pages, interestingly enough.

The other programme that is currently being evaluated, and I can tell you nothing about it because we have just finished the pilot, is the adult basic education science and math programme. Hopefully, the next time I come down to talk to you, I shall be in a position to say a little about it.

I shall conclude at this point having, I think, just about covered the general areas I was asked to address.

## Distance Teaching at the University of Otago
## by Ms. Penny Love
## Head of the Distance Teaching Unit
## Otago University Extension

When I first received an invitation to this conference, I looked at the list of participants and I thought, "Why us?". We are very small, comparatively recent, and definitely not in this league. I was even more surprised to receive a later fax asking me to focus part of my presentation on course design, an area in which giants like the Open University are renowned for their expertise. Under the circumstances, what could beginners like us offer to the conference?

The only answer that I could come up with is the similarity of our situation to that of our hosts. We are both relative newcomers to teleconferencing, and both facing major new development with all its challenges. We have both started in a small way and overcome the initial hurdles. Now we are ready to move on from the experimental stage to that of expansion.

What I should like to offer this conference, then, is firstly my reflections on some of the difficulties we have encountered and will encounter in the developmental process. How do we cope with the shift from what is essentially a cottage industry to the more industrial mode? It will be essentially a nuts-and-bolts approach focussing on grappling at first-hand with fairly basic problems. Secondly, I shall focus on some basic design issues and illustrate my points with reference to some of our courses. I definitely do not intend to provide a sophisticated summary of the literature. Rather I shall draw on my own experience and that of my colleagues to whom I am indebted for much practical wisdom. I am hopeful that some of you, having surmounted the problems we are currently facing, will be able to contribute comments and suggestions which will be useful both to us and our hosts. My presentation, then, may well reflect considerable naivety, but I make no apology for that. I cannot be other than I am. We New Zealanders are a nation of incorrigible "do-it-yourselfers" and in that spirit I proffer you the following discourse.

### Background to Distance Teaching at Otago

I should like to begin with a brief outline of conditions in New Zealand and the background to our operation. New Zealand is a small country, only 269,000 square kilometers in area, a member of the Pacific Rim Community and relatively remote from those giants of the First World economy, Europe and North America. We have a population of 3.2 million which is unevenly distributed as much of the country comprises mountainous territory which is very sparsely populated. Twenty to thirty years ago we had a larger rural community but over the last decade in particular there has been considerable urban drift, with the result that in some ways rural areas

have poorer facilities than they had 20 years ago. We have four major cities, and a sprinkling of provincial cities and towns serviced by six universities.

When Peter McMechan, now the Director of The Commonwealth of Learning's Pacific Programme, arrived in 1981 in Dunedin to head University Extension at the University of Otago, he was fresh from the University of the South Pacific where he had had considerable experience with their teleconference network. He was concerned with the merits of teleconferencing and what it could offer New Zealand as a whole. There were obvious applications for the local university patch, the Otago Southland region. At that time, Otago University Extension was still sending out lecturers and mounting courses in the hinterland much on the lines of the old WEA model. There is, of course, nothing wrong with the visiting lecturer model per se. It was simply that, given the sparsity of the local population, all too often courses had to be cancelled for lack of numbers. Peter saw that by using the teleconference system we could substantially improve the odds in the numbers game, could offer even the most remote settlements access to the tertiary system and eventually establish a national system, which would make sound economic sense in a country in which the educational resources are spread very thinly.

It turned out to be no easy task for all the usual reasons: lack of funding, lack of trained staff, and the reluctance of the University to commit itself to a dubious and possibly academically inferior activity. However, he was fortunate in being able to put together a small and dedicated group: firstly, Mr. Jack Salmon, technical manager; Dr. Claire Matthewson, now Director of Extension Services at the University of the South Pacific; and Don McKenzie, lecturer in music but obsessed with electronics and computers. These people together formulated a "do-it-yourself" approach to teleconferencing.

They had very little money, and they did not like the standard of currently available equipment which they trialed. In any case, it was too expensive and so they set out to invent their own. Jack was, and still is, a brilliant inventor. He designed the Unitel, our trade name for the four-wire unit which has been patented by the University.

The Unitel is linked to all our teaching rooms via four wire circuits, leased on an annual basis from Telecom New Zealand, and the whole system is bridged in Otago University Extension by means of a bridge specifically designed and built by Jack. Each teaching room is equipped with a Unitel, tabletop microphones and extension speakers. Many also have slide projectors and video playback monitors.

We now have venues in some 30 sites around New Zealand. So, you can see we have got fairly extensive coverage of the country with more sites concentrated in the south because that is our particular university area. The beginnings were much more humble, however. The original bridge was housed, believe it or not, in a broom cupboard.

unitel
NEW ZEALAND

(3) Indicates the number of sites in a location, if more than one.

In the early days, things were equally hectic on the programme side. I sympathize with what Professor Lalor was saying this morning about people sleeping on the floor and working until two o'clock in the morning. It was a bit like that for us, too. Lack of staffing meant that Dr. Matthewson, her print editor and one part-time programme officer did everything from course design to scheduling, to posting out material. However, the dedication of this tiny staff brought results. In 1986 the credit program opened in the southern region with 200 enrolments. In 1990, we have 850 students enrolled, and 1550 paper enrolments. Our programme, both national and regional, includes 16 programmes and 51 papers.

It all seems light years away from the early experimental equipment and the experimental pilot programmes. Yet, once again we are faced with the prospect of a quantum leap forward. Technology is changing very fast, and we have little time in which to make decisions which will affect the nature and shape of the network and its programme for many years to come. It is an exhilarating but frightening prospect.

The challenge that is presented by the new technologies is formidable. We have on the one hand the prospect of dazzling new inventions, and on the other the spectre of the enormous capital investments that these new developments require. How do we proceed? Commonsense tells us that our first priority should be to keep our feet firmly on the ground and ask of any new technological development: What use is it? How will it advantage our students? How will it affect our future options? However, I am well aware that is a counsel of perfection. The most important question will in reality be, "Can we afford it?". Or in our particular case, "Can we afford not to buy it?". Our particular developmental dilemma is probably not all that unusual and may be the subject of some profitable discussion.

As I have already mentioned, we use a four-wire system which depends on permanently leased circuits with an annual rental. The system provides exceptional audio quality and is easy for the students to use. We also have two-wire units which can be added for extra flexibility, and we can bridge national and international tolls. We are currently developing a polling device to provide continual line testing and, associated with it, an electronic blackboard. The electronic blackboard or electro-writer is being developed by Michael Croot, a post-graduate physics student at Otago. It will work either with existing video monitors already housed in many venues, or with a computer. The latter gives better resolution and also provides the facility for data transmission overnight. When planning future development, we placed higher priority on the relatively cheap electronic blackboard than on a very expensive interactive video system.

Into this equation stepped Telecom New Zealand with its great big seven league boots. Basically, Telecom wish us to change to a two-wire system and lease ports on their new AT&T bridge. They are offering us a considerable financial inducement to do so. It is a complex situation and negotiations are obviously confidential, but I would like to make some observations and raise some questions.

**Technological Issues**

Firstly, how do the smaller institutions like us deal with the powerful telecommunications conglomerates in order to ensure they get the equipment that is most useful for them, that will last, and that is adaptable? The educational institution's interest and that of the corporate giant is not necessarily the same and yet power rests with the corporate.

Another important question is whether once bought these exciting new developments will work well under local conditions which are variable. What appears to be wonderful in Wisconsin might not work so well in rural New Zealand. What kind of provision will there be for local service and back-up?

For us, the present situation seems doubly hazardous. What we have been working with for five years is a highly hand-crafted system, tailored to our needs, still functioning very well but beginning to seem a little old-fashioned. We are striving to adapt to the future, but may not be able to do in the same way as we have done in the past. The decision to work on our own polling system, electrowriter, and data transmission system made sound economic sense at the time. Research has proceeded well and the results of the prototype model are encouraging. However, hand-craft is slow, and we have yet another hurdle to jump if we move to a two-wire network. All our new developments are designed to work with a four-wire network and will require modification in order to work with the proposed new network. One begins to ask, is time money and, whether, given the likelihood of competition, we should move faster. Should we abandon the hand-craft approach and move to a more industrialized mode? Sometimes, when depressed, I feel a bit like the narrator in T.S. Elliott's poem, *East Coker.*

> *"And so each venture*
> *is a new beginning, a raid on the inarticulate*
> *With shabby equipment always deteriorating*
> *...And what there is to conquer*
> *By strength and submission, has already been discovered*
> *Once or twice or several times, by men whom one cannot*
> *hope to emulate..."*[1]

However, this mood never lasts long. I reflect that development is always problematic and no system is perfect, despite the glossy brochures and the P.R. personnel with their free pens and wall-to-wall teeth. Although we should be wary of

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1 *T.S. Eliot, Collected Poems 1909-1962 (Faber and Faber Ltd., London, 1963), p 203*

Greeks bearing gifts it is not dishonourable to buy expertise. I suspect that the solution to our technical problem lies in a compromise - a judicious combination of what we can afford as far as both time and money are concerned.

In some ways, we are already doing this. We are modifying our current two-way units for use on the completely two-wire system, and, although Telecom will provide the system and the bridge, we will provide the Unitels. Telecom know a good thing when they see it and are interested in producing and marketing the unit.

Given our financial status and the de facto monopoly which Telecom New Zealand and its new owners will continue to hold for some time, I have no doubt that we shall be coerced into buying their new system. But at least they are buying our new Unitel, and that gives us some illusion of a little control over our own destiny. I suspect, however, that in the long run in any country where communications technology is controlled by a monopoly, distance education will be at the mercy of that monopoly. People like us can manipulate and moderate their influence in small ways only.

**Issues in Programming**

Just as we have reached a watershed as far as our technological development is concerned, so too in the programming area we are facing new developments. The first regional programme began with courses which could be provided largely by extension staff themselves. They were adaptations or extensions of what we had already been doing. Once teleconferencing proved a success and the national network was established, other programmes were offered. These were largely faculty led and, as we were touting for custom, we were grateful for what we received and had to accept that we did not have a very large say in the matter. That situation has now changed. As our current network nears capacity there is competition for network time and we can, if not choose our programmes, at least order priorities. In addition, we are faced with the probability that new technology will enable us to offer up to three courses simultaneously and so expand our programme greatly. It is clearly important for us at this juncture to take stock and adopt a philosophy which will enable us to make the best possible use of the new opportunities opening up.

When we consider our programme so far, our primary conviction is and will remain that the way to get the best use out of the teleconference network is to provide what the community needs, not necessarily what the faculty wants. In a dual mode institution we must listen to faculty, but it is just as important, perhaps even more so, to look at society out there and to assess its needs, something which universities such as ours modelled on the Oxbridge tradition are not very good at. In this respect, the university reminds me of the wealthy Edwardian lady - more interested in polishing the table manners of her own privileged offspring than in offering sustenance to the poor clamouring at the end of the street.

When we look at our country we perceive a number of factors which contribute to changing educational needs and, in particular, to demand for various kinds of distance education:

1) The information explosion

2) The feminist movement

3) The resurgence of ethnic minorities. (This worldwide movement is particularly conspicuous in the Pacific at the moment.)

4) Unemployment - currently 7% of our population.

5) Changing policies in health and education. In particular, the devolution of responsibility from central government and its agencies to the community, thereby creating a greater need for training and education of all sorts within the community.

6) Privatization of former government departments and state owned enterprises, with the consequent fragmentation or destruction of traditional civil service training programmes.

7) Education sector reorganization. In New Zealand, the whole of the current education system is being reassessed and changed. In some cases restraints are being removed, and in others new ones are being imposed. Traditional modes are being broken and new opportunities are opening up.

Given the aforementioned conditions, how do we design a teleconference programme that meets the obvious needs of our country? Very few of the factors I have identified fit with the traditional role of the university which sees itself as a purveyor of education as distinct from training. As a graduate in medieval languages with a research interest in Old Icelandic, I have some sympathy with that view - "The pursuit of excellence" as it is expressed in our corporate charter. However, I do not see that this purely intellectual approach is incompatible with the more utilitarian approach required by the need for training. The two may be complementary and certainly a university which ignores community need is failing its constituency. One of the major ways in which a university can meet the requirements I have outlined is through the development of a distance education programme based on a teleconference network. We can address the needs of the community within the community.

Once again, this is a counsel of perfection. How do we design such a programme working as we do within a dual institution? Although the balance of power is changing slowly we are still to some extent faculty driven. In order to succeed we need to be considered as an equal partner in this enterprise and to be accorded a

professional role in the development of the overall programme. The process must include:

1) An analysis of society and its needs, by which I mean continuing needs, not passing fads or the political flavour of the month. Consideration must also be given to what prospective students can afford in terms of both time and money.

2) Market research, including the testing of pilot programmes and negotiations with professional associations. Market research is not done with a few colleagues over drinks at a conference in Paris, New York or Rotorua.

3) Discussion with faculty. How do they perceive the need? Can they service it at the appropriate level? Do they have the resources? Such discussion is essential in order to ensure that one produces a programme which is both realistic and does not compromise academic standards.

4) Finally, analysis of the provision made by other educational institutions. We are far too small a country for pointless duplication.

When all these factors have been considered, we should be able to build up to a programme which fulfills real needs in an appropriate manner and is of a high academic quality. Such a programme should also be designed to allow for future development. This all adds up to professional planning in order to make the best possible use of the teleconference network. A beautifully designed course is no good if the students don't enroll. Needless to say, it is going to be difficult for us to achieve such a planning procedure within a dual mode institution.

**Current Programmes at Otago**

Perhaps, now we should look at a few of our current programmes to see how they meet the previously mentioned criteria.

The University of Otago, until recent years, had the only medical school in New Zealand and still possesses the only dental faculty and the only university-based pharmacy school. As such, it has a special responsibility to the community as far the health sciences are concerned. Our current programme includes courses in pharmacy, dentistry, occupational health practice, and community nutrition, most of them at post-graduate level. The programme makes sense in that it draws on the specialist strengths of the University and it does not cut across the activities of other distance educators in New Zealand.

A quick look at a few of our programmes will show how they fit some of the community needs I have mentioned. The Post-graduate Diploma in Clinical Dentistry provides training in comprehensive restorative dentistry, which was not

taught to old dental graduates. It is only comparatively recently that it has become apparent that most people are keeping their teeth rather than getting dentures, and accordingly they need dentists with skills that this course provides. The Diploma in Occupational Health Practice also responds to community needs by providing training in industrial health care - a need which has been created by the move from a primarily rural economy to one which has a manufacturing base.

Two new and contrasting programmes are the Diploma in Sports Studies and the Certificate in Theological Studies. The former is an obvious choice for a nation obsessed by sports. Our hosts know that we are not the best cricketers in the world, but we are pretty good at netball and rugby, and we are certainly excellent at most forms of sailing as even our North American friends will concede. In this case, perceived need is backed by full government commission which clearly identified the need for training in this area. The Certificate in Theological Studies is at first sight a surprising success but not to us. We have run non-credit short programmes on theological topics since 1985 and they have always been well subscribed. The course coincides with an interest in feminist theology and with the growing participation of women and the laity in the church.

Another area that we intend to expand is that of joint enterprise with professional associations to provide professional continuing education. We have begun with valuers, surveyors, nurses and general practitioners and shortly hope to include lawyers, engineers and dentists. We provide the network, the administration and advice on programme design as requested. The associations provide the teaching. Note that the initiative comes from them rather than from the University.

So much for the successes. Do we have any courses that haven't enrolled as well as expected? I am afraid that the answer must be yes. For example the Postgraduate Diploma in Science (Biotechnology). Despite the fact that the course is enjoyed by the few who enroll and they produce good results, we have a consistently low enrolment. It is difficult to ascertain the reason but the following factors must be important. Firstly it was faculty led and very little market research was done. Secondly there was a general perception that in a country largely dependent on agricultural products Biotechnology ought to be in demand but there was no clearly identified need or target group. Clearly we should have done more market research and mounted a pilot programme. It is an experience which makes me wary of two new proposals for the future - courses in Bioethics and Marine Biology. These suggestions seem similar in that they are faculty led and appear to be exciting and innovative but not tied to a specific profession or proven community need. I would like them to be successful and will therefore do my best to ensure that they go through the kind of analysis that I have suggested before we accept them into our programme. With our small population base there is no margin for error. It is clearly vital that we plan our course programme carefully before we actually turn to the issues of individual course design.

**Course Design**

I said earlier that it is no good having a beautifully designed programme if nobody needs it. However, it is equally true that however much students want to study a subject their resolution will falter in the face of a badly designed course. They may drop out altogether, they may not come back next year, or they may only partially achieve the objectives set for them at the beginning of the course.

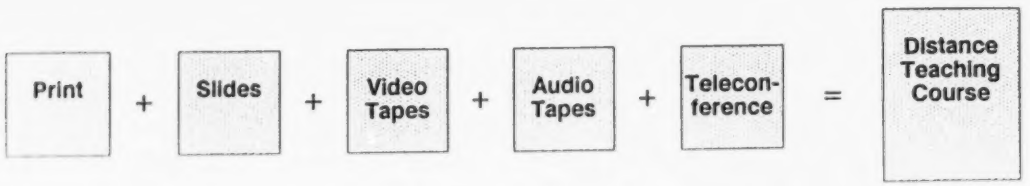
It is not surprising then that course design, or instructional design as it is often called, receives a great deal of attention in the professional journals concerned with open learning or distance teaching. However, I suspect that it is not only because of its intrinsic importance but also because it is something that the professional educators can get their teeth into. It aspires to the condition of an academic discipline, a "philosophy" (in inverted commas). While not wishing to decry the activities of the experts - I actually read and enjoy many of their articles - I would like to adopt a much more pragmatic approach, what I like to call the gumboot approach to instructional design. (Perhaps I should add a footnote here for those unfamiliar with the antipodes. In our part of the world the gumboot has replaced the Wellington boot. It has a less imperialistic connotation for us rude colonials.) Therefore, after a brief introduction discussing what I feel are the basic principles involved I shall look at some of our programmes in greater detail, and in so doing, raise some questions about the design of course material. I hope it will be a realistic approach outlining shortcomings as well as successes. I think it is important to acknowledge that everyone at some time encounters intractable problems, and has to accept solutions that are less than perfect. I feel that some instructional design guides are a bit like parenting guides. The theory is all very well, but what about the ugly reality? How can we measure up to the ideal?

For us the most important principle of course design is clarity. The students must know precisely what they are expected to achieve, how they can reach these objectives, and when this will be required of them. The subject content must be clearly presented in a form that is as easy as possible to assimilate. These are very basic and simple goals but no less valid for that. Of course, the ways in which these goals could be achieved are various and I am aware that the assertions I have just made beg many questions. It is here that the professional literature is important and I leave that to you.

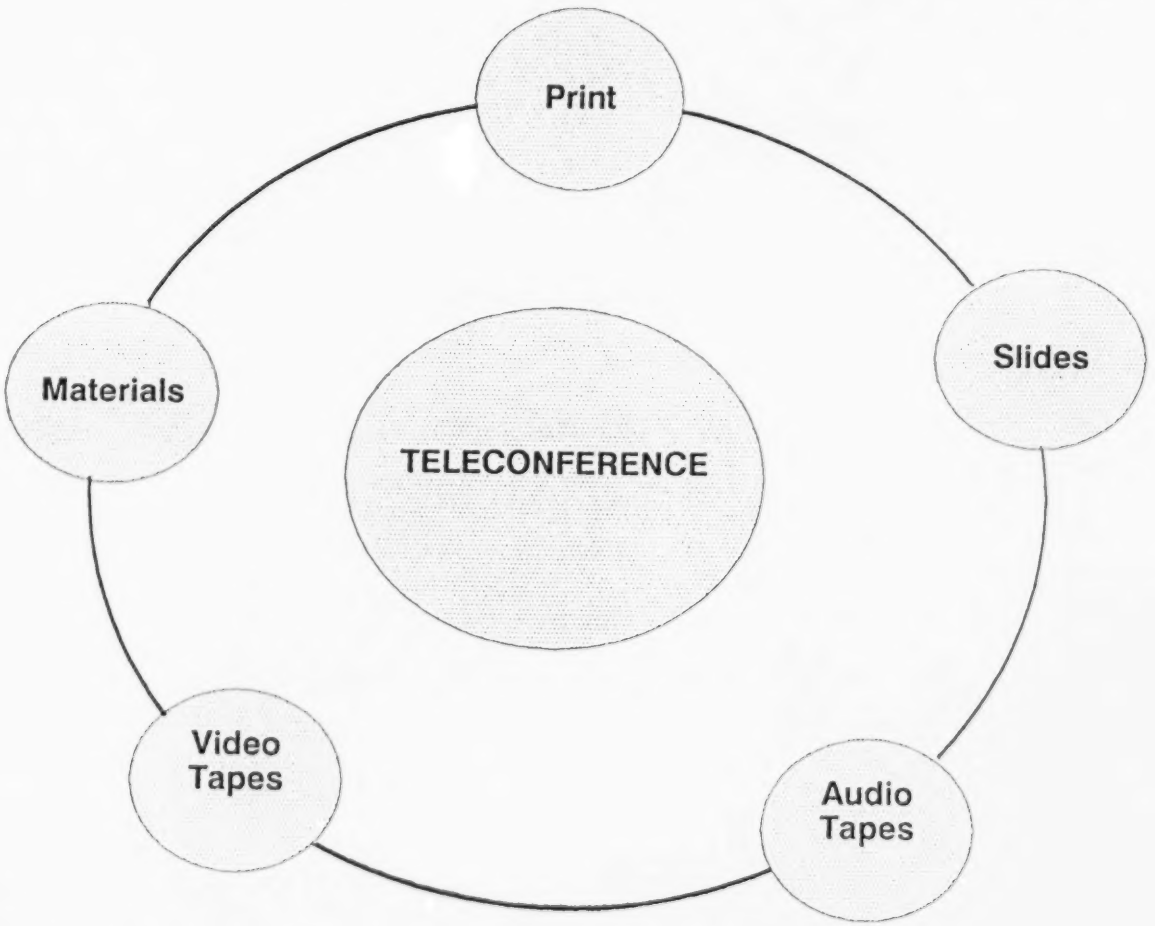
**Course Design for Teleconferencing**

As we are here to talk about teleconferencing I should like to begin by emphasizing what I believe to be the most important principle of teleconference course design. Designing for a teleconference course is very different from designing for an ordinary distance teaching course which is traditionally print based. A teleconference course can as we all know make substantial use of print, but does so in a different way.

There are many distance courses, and even some on-campus courses, that now adopt a mixed media approach to instruction. The important thing about designing a mixed media course for a teleconference programme is that the teleconference must be central, not an extra frill that is added on to keep the students happy. The mixture of media should not be a series of add-ons, a linear progression, as in the diagram below.




Rather, I like to think of the design for a teleconference course as following this diagram:



In this model the teleconference plays a central and coordinating role. As well as conveying information, it is the central focus where all the elements should meet. If you have designed your course well each one of the elements of the outer circle will have played its own part in contributing to the success of the teleconference. Note that all the elements are inter-connected and that it is a two-way process. What is said and done in the teleconference not only draws on the other media but can reflect illumination back on them. The interactive nature of the medium allows the student to question anything that he/she has not previously understood in the material already encountered. The result of good course design should be a harmonious whole which is greater than the sum of its parts.

I have deliberately emphasized the importance of the teleconference because it is the only medium which provides regular and instant interaction. The residential school is an infrequent occurrence and not a practical option in some cases. It is the interactive aspect which allows the teleconference to have a dominating and continuing importance. We sometimes talk of the print material as being the equivalent of the on-campus lecture in that its function is to convey subject content, and the teleconference as the equivalent of the on-campus tutorial. This is to some extent true but it underplays the significance of the teleconference. Another more prosaic but important reason for assigning such an important role in your course to the teleconference is its expense. Compared to the capital and maintenance costs of the on-campus bricks and mortar the teleconference is cheap but relative to other distance teaching media it is expensive. You must therefore make the best possible use of it.

Cost effectiveness is a principle that should always be applied when choosing your media mix. Every element should tell, that is, have a definite function. Not all courses need to use all media. Some may use them all, and some may use only print and the teleconference. Neither approach is necessarily better than the other. It depends on the nature of the subject, the resources available and the nature and number of students. It is true that the principle of redundancy has some point. Different students learn in different and sometimes in surprising ways and so it is a legitimate method of design to present the same information more than once in different media. After all the on-campus lecturer often repeats the same message in several different ways. However, not everyone can afford such an extravagant approach and should not feel severely disadvantaged if they cannot. Prodigality can sometimes overwhelm and confuse students. Flashy technology improperly used can be the curse of our profession. I am sure that we have all in our time seen videos which to paraphrase Macbeth are "full of sound and fuzzy, signifying nothing". There is a tendency when faced with the exciting possibilities that new technology opens up to be overwhelmed by the glamour and sophistication of it all and forget to ask basic questions such as "What use is it? How will it help our students in this particular course?" Being of a parsimonious nature I must have answers to questions such as these before I commit resources. I must hasten to add, though, that I am not a Luddite and I fully recognize the exciting possibilities of new developments such as

ISDN. We look forward to using them. I hope to discuss these matters further with those of you who already have these marvels.

Another feature of the teleconference that makes it different from traditional distance learning is that our students meet regularly in groups, usually fortnightly for their teleconference. The proponents of open education sometimes see this as a restrictive process but we feel its advantages outweigh its disadvantages. We like the creation of a group dynamic, in fact a double group dynamic - the local teleconference group and the class as a whole. Course design then should make constructive use of these dynamics and when using different media look at their application to the student as an individual, as a member of the local group and a member of the whole class. The simple chart below which I have improvised from the basic one produced by H.E.D.C., our educational development resource centre, gives an idea of what I mean. It doesn't contain all the permutations but could easily be extended. It is a valuable tool to use with the on-campus lecturer who has been used to considering only the mass.

| | Printed Material | Audio Tapes | Slides | Video Tapes | Telecon-ference |
|---|---|---|---|---|---|
| Students as Individuals | | | | | |
| Students as Groups | | | | | |
| Whole Class with Teacher | | | | | |

The reasons then for the choice of media are various as are the proportions in which you may combine them. My diagram of an ideal teleconference course is misleading in that it gives equal weight to each medium, whereas the weighting must vary, as I said before, according to your subject, your resources and the nature and number of students. It is a bit like selecting a cricket team really. You don't want an entire team of fast bowlers, nor do you want a complete team of good all rounders. Some members of the team will have specialist functions. They must all be chosen on merit but a wise selector varies his team according to the pitch, weather conditions and the strengths of his opponents.

**Illustrative Examples of Course Design at Otago**

The first courses I would like to look at are those which were already existing on-campus courses and had to be adapted for distance teaching via the teleconference system. The major advantage of working with an already existing course is that the subject matter, or content, is already clearly defined and resources have been built up. The major problem is that existing structures may not be suitable for teleconference or distance teaching and faculty members are often reluctant to change what they know is good and works well within the familiar context.

One such course is the Geology I unit which we have been teaching now for three years. It comprises two half units which are offered in alternate years and which have the same course prescriptions as the on-campus units. It has been a good test of the efficacy of the teleconference system because both sets of students sit the same final exam and are marked to exactly the same standard. The results have been pleasing in that our distance students have produced just as good results as the internal students and sometimes slightly better. This kind of outcome goes a long way towards allaying fears that distance teaching courses will dilute academic standards. The course can also be considered a success in terms of the enthusiasm generated among students and the relationship of mutual respect and affection that grew up between staff and students. However, the road to success has been, if you will pardon the expression, a rocky one. The basic course design was a sound one given both internal and external constraints, but there were problems to be surmounted, and there are still some issues to be resolved. I should like to begin by giving a little background to the course.

When members of the Geology Department came to produce this course they had been teaching the internal course for many years without revision and they intended to kill two birds with one stone, that is revise the internal course at the same time as producing the new external course. In the event this proved a good idea as the greater degree of organization required for distance teaching and the need to produce extra resource materials had benefits for the internal course as well. It was a two-way flow, then, and I know that internal students were at one stage demanding access to materials, especially the audio tapes that were produced for the distance students. The distance students in their turn benefited from the fact that the

department already possessed excellent resources as far as slides and videos were concerned. The fact that the staff were simultaneously revising the internal course also meant that they approached their task with a greater degree of flexibility than might otherwise have been the case.

This flexibility was to be stretched to its limits to enable us to teach at a distance a course that has a large practical component, and also requires the assimilation of a great deal of information. Geology required us to utilize all possible resources and resulted in a multi-media approach. We used print (including a set text), audio tapes, video tapes, slides, boxed sets of rocks, minerals, etc., a week long residential school and of course the teleconference sessions.

The organization of so much varied material was vital. The first step was to break the course down into modules so that the students could assimilate one at a time without being overwhelmed. Each module culminated in a teleconference after the students had worked through the other materials at their own pace. The teleconference usually began with a mini-lecture accompanied by slides and then moved on to a more interactive phase using a question and answer session. The importance of allowing a flexible format for your teleconference was vividly illustrated by one session in this course.

In the first year of the course, two days before the module on seismology was due to begin, we suffered a major earthquake in the southern regions. Damage was slight as the epicentre was in an uninhabited area, but strong shocks were felt throughout the regional teleconference area. In the ensuing teleconference students from each group described how the shocks were felt in their particular area. The lecturer was able to help them to relate their perceptions to the geological structure of their particular area and as a result the whole class received an extremely valuable lesson in seismology through relating personal experience to theory. It was a wonderful example of the flexibility of the teleconference session, the way in which it provides a spontaneous response that the more industrialized methods of distance teaching cannot.

The basic lecture content was supplied on audio tapes. Each C60 tape contained the equivalent of five on-campus lectures and so had to be carefully structured in order not to confuse the student. The tapes were broken down into small units which were clearly marked on the wrapper so that the student could easily find and replay sections as required. As well as providing content the tapes were also an organizing voice that directed students to other media, including print, and also talked students through practical exercises. We aimed to provide an active as well as a passive learning experience. Video tapes were also used to illustrate practical techniques.

The mixed media approach is the reason why the coursebook does not look like an average correspondence based coursebook. It is not designed to stand alone. It contains some subject content but it is also an organizing device and helps to co-

ordinate the media. For example, it lists the slides the students will see in each teleconference.

At its best then this course illustrates what I have said earlier about each medium playing its part in creating a harmonious and working whole. What of the problems then?

The first problem is one that is always encountered to a greater or lesser degree when adapting an on-campus course - that of meeting course prescriptions which cannot be changed. In the case of Geology it is the field trips and laboratory work that provide the challenge. The on-campus students do three hours laboratory work per fortnight and attend a number of field trips at weekends. How could we provide an equivalent? We adopted a two-pronged approach. The students are directed to do practical and field work at home using materials sent out. As well as that they attend a one-week residential school at the end of the first semester which culminates in a practical exam. This combination works but is far from ideal. The residential school, although in many ways enjoyable and stimulating is exhausting and stressful for both staff and students. Most students pass the practical exam but the majority still feel they need more practical work and are not confident that they have mastered the necessary skills.

The ideal solution would of course be a second residential school but neither academic staffing constraints nor departmental or student resources permit this. It is often stated that providing a practical or clinical course at a distance is simply a matter of course design. It is clearly also one of resources and it is an area in which the ideal cannot be attained without considerable expenditure. In the Geology course we had to compromise and the result while reasonable still leaves room for improvement.

The Postgraduate Diploma in Clinical Dentistry on the other hand illustrates what can be achieved with greater resources. The clinical component is based on work that the students do in their own practices. Over three years they have to prepare five comprehensive cases which demonstrate their mastery of restorative techniques. These cases are constantly supervised by staff from the Dental School who visit students in their practices on an annual basis. In addition the students begin the course with a two week residential school followed by a one week one in the second year. The course is a success but there is no denying that it is expensive in terms of staff time and resources. It is a course that can be run only with limited numbers (we have restricted entry) and the students must be able to pay high fees, buy expensive equipment and be able to afford to attend the residential schools. The faculty however feels that it is worthwhile as it has made a significant contribution to their postgraduate programme.

The second problem that we encountered in the Geology course is one that I suspect is fairly common in dual mode institutions. Academics when faced with the kind of

mixed class that we get in distance teaching often fail to allow for the fact that some students have virtually no academic background. In this case the problem was mathematics. Many of the class were simply not equipped to handle the mathematical calculations involved. The academic staff were surprised by the students' ignorance and at first adopted the "Just carry on and it will come right" attitude. It was some time before we managed to convince them of the need to provide extra assistance. This experience highlighted for us two important factors in course design:

1. It is essential to make the students aware of the basic skills that are required before they enter a programme.

2. When you cannot trial a programme allowance must be made within the course structure for the provision of remedial material and course support when necessary. We now routinely offer study skills tapes at the beginning of each course and students find them very helpful.

The Geology course is an undergraduate course. Postgraduate courses have their own particular problems and it makes little difference whether one is designing a new course or adapting an old one. In both cases the postgraduate student has to learn not just to assimilate material and master new skills but also to come to grips with the educational process itself, to learn how to enquire, to synthesize, to research material, to think in a creative and original manner. To do this the average student requires guidance through a mass of material which raises two design issues:

1. How can one provide access to the required amount of material?

2. To what extent and how should the student be guided?

The first question is easier. We are beginning to address this problem by providing a library service, something which we believe to be essential for any tertiary distance teaching programme. At the moment our service is very limited and we are aware that we are unlikely to be able to expand it as we would wish because of the expense. Technology is helping in providing the facility for computer searches of the literature, but I think we have to resign ourselves to the fact that many of our postgraduate coursebooks will continue to be very big.

The second question is less easy to answer. On the one hand we have the rather austere approach of many academic staff to postgraduate students. They believe that they should not be spoon-fed and material should not be synthesized for them. Their idea of course design is a heap of offprints with a brief introduction. On the other hand we are aware of the usual principles of course design which emphasize the importance of a carefully structured course. How do we resolve this impasse? Once again we have no ideal solution but the teleconference can improve the minimal or loosely structured coursebook by assessing the students' response to

reading and leading discussion on it. I am not saying that the teleconference should be used as a substitute for a carefully designed coursebook but it can provide a focus and form of guidance. We find this arrangement works reasonably well when the students in the class are all on the same level and already have a basic grounding in the material they are dealing with. For example, the doctors in the Musculoskeletal Medicine course and the pharmacists in the Master of Pharmacy course seem to cope quite well with the heaps of offprints approach. However the deficiencies of this kind of course design would become more apparent in a class like Biotechnology where the only pre-requisite is a science degree containing some biological science, and the students obviously vary greatly in their subject knowledge. Some of them struggle with the reading material in some areas and are grateful for the fact that more guidance is provided than in the Pharmacy or Musculoskeletal Medicine course. There are clearly some dangers in giving the students too much freedom and insufficient support in the form of good course design.

Freedom within a structured and well designed course is another matter. Distance students are on the whole mature adults with professional experience in their area of study and it is important to allow them to contribute that experience as part of the learning process. They have much to offer, and a well designed course will encourage them to do so through assignments, projects and practical exercises. However, the teleconference offers an opportunity for student participation that is matched by no other medium. I should like to illustrate this by referring to two of our courses in particular: The Diploma in Occupational Health Practice and the Certificate in the Theory and Practice of Social Work.

The most interesting thing about the Occupational Health Practice course is that it is not entirely faculty based. Instead it uses some teachers who are out in the community, working in the profession and the teleconference plays a vital role in accessing this expertise. Some practitioners even bring patients along to the teleconference. Many of the students have years of experience in their fields and the lecturers deliberately draw on this. The students are positively encouraged to contribute their experiences and opinions. This results in very lively and stimulating teleconferences in which emotions sometimes run high. Recently we had a specialist from Australia visiting the unit. She is an expert in instructional design and print production from a large Australian institution which provides basically correspondence tuition. She attended one of the OHP teleconferences and was bowled over by the immediacy and emotional impact of one of these sessions. Afterwards she said to me "This isn't distance teaching. I'm not sure what it is but it's something different". She had previously been somewhat dismissive when looking at the print material associated with the course and it wasn't until she sat in on the teleconference that she saw how the whole thing worked with the teleconference at the heart of it. Again, I would certainly not claim that this is a perfect programme but what it gains in vitality makes up for some of the rough edges. A more formal method of achieving student input is used in the Master of Pharmacy course where selected students actually do some of the teaching and produce course material.

Although I am firmly convinced that student input ought to be an essential part of distance teaching course design I feel that I should point out that there are dangers. Student participation does need some form of control and this is illustrated by the Social Work course. This course has been deliberately assigned three hours of teleconference time per week, a much larger allowance than for any of our other courses. All students accepted for the course must already be practising social workers in either a professional or a voluntary capacity, and the course is deliberately designed to draw on their expertise and that of other professionals whom we can access through the teleconference system. The teleconference then is designed to be interactive. Generally the chairman introduces a topic which the students have prepared by working through the relevant sections of their coursebook. The students then break into groups, work out their response and then report back. Usually a lively debate ensues. This is a good teaching tactic and the entire course is based on group dynamics even as far as some of the assessment is concerned. The problem is that sometimes the teleconferences get out of control, the group dynamic takes over and leaves the lecturer stranded. Sometimes, for example, I have walked past the Dunedin teleconference room and have heard the babble of animated discussion going on. Meanwhile, the lecturer in the teleconference studio upstairs is lecturing on, blissfully unaware that those downstairs are not listening and are in fact doing their own thing. This may or may not be a bad thing depending on your point of view, but certainly if you are designing a course which involves this kind of group discussion you have to be aware of the dangers, and if you wish to apportion student and staff participation more evenly, run a more structured session. It can at times be a difficult balancing act.

**Conclusion**

But then the same could be said of all course design for teleconferencing. You have to weigh your resources against student need, you have to juggle your media so that you provide a satisfying pattern without anything falling to the ground. You have to balance the ideal and the real and emerge with practical results. There are many ways of achieving this from the heavily industrialized mode which allows for extensive trailing and professional design teams to the more do-it-yourself operation that we run. Of course I would love to have at my disposal the resources of the larger distance teaching institutions but as I hope I have illustrated one can get by without enormous resources and there are compensations - flexibility and a sense of adventure being two of them. I think that each institution must find what suits it and its resources and build from there, always of course allowing for change and growth. Work within your constraints and don't worry too much about what you haven't got. Each method has its particular advantages and disadvantages.

My approach to the philosophy of course design is basically a pragmatic one. It is essential to go to the experts, read the literature and absorb what the professionals have to offer, but it is also important to learn by doing, to trust your own judgement and to rely on the experience you accumulate.

Some years ago my brother, who is now a quite distinguished botanist, was working in a local brewery on a student summer holiday job. This was a small independent brewery which produced a very good and very distinctive brew. One day the brewer fell ill and so the foreman asked him to go and start up a brew. Brian, the foreman, was to give him instructions and Brian said: "Get into the vat and fill it up to the top of your gumboots with water and then put in two shovelfuls from that sack and one from that sack, etc...". My brother's scientific instincts were outraged and suspecting that his leg was being pulled he went to the manager and politely requested instructions. The manager said: "Get into the vat and fill it up to the top of your gumboots...".

The gumboot approach to course design has its limitations, and I must admit that that particular brewery occasionally produced a brew that was undrinkable and had to be thrown out. The more scientific approach results in greater consistency but can sometimes result in a loss of flavour. Therefore, while recognizing the importance of investing in some laboratory equipment I shall continue to clump around in my gumboots.

## The Philosophy and Role of Teleconferencing in Distance Education
## by Dr. Claire Matthewson, Director, Extension Services, University of the South Pacific

This assigned topic, apparently simple, could be rephrased with two other titles which would be more suggestive of its actual complexity. These are:

Bridging the Distance : extending possibilities

and

Increasing the Gaps : the creation of elites.

That teleconferencing in Distance Education can do both of these things, even at the same time, needs to be a basic awareness of programme designers. For work in developing regions, this awareness is especially critical, but nowhere should it be far from the forefront of our concerns.

The dichotomy highlighted by these re-phrasings - bridging the distance/increasing the gaps - is that which can develop between 'philosophy' and 'role' : where the latter, not planned carefully, fails to express the former and, despite good intention, even enacts something counter.

**Relation between Philosophy and Role of Teleconferencing**

The philosophy of teleconferencing, among distance educators, is probably unlikely to cause great controversy. Whatever one's own words, the values will be common - to do with bridging, enhancement, extension and support. These are philosophically simple and context-independent.

The role of teleconferencing is philosophy applied. It should differ in relation to geographical context. It will differ in relation to the fields of its endeavour : course design and delivery, support systems, administration. It will, once established, become infrastructural.

An institutional comparison may exemplify good reason for establishing only roles that are context-related. Institution A has, for its outreach purposes, a full duplex, dedicated, teleconference network. It comprises sixty-five sites, spaced according to population throughout a small, developed country. The terminals are established in cooperating institutions and equipped simply enough to be student-operated. For all of its students (approximately 1,500), the language of instruction is their own first language.

Institution A, with its philosophical commitment to bridging distance 'live' by telecommunications, can ascribe various roles to its teleconferencing.

Institution B has, for its outreach purposes, a half-duplex, dedicated network comprising nine terminal sites. It serves a geographical area 6,500 km across, 28 million sq.km in total and most of it water. Two of its eleven countries have no network link at all. One country alone (with its single terminal site) comprises one hundred populated islands; one other comprises eighty, another thirty-six. One country alone has sixty-five identifiable languages, twenty-one of which have more than one dialect. The language of instruction (for the approximately 13,000) is usually their second, for some even their third. Many students over their study years cannot visit a terminal site.

Institution B, with its philosophical commitment to bridging distance 'live' by telecommunications, has available to it a range of teleconferencing roles which are not the same as its sister institution's.

The University of Otago is the first example given; the second is the University of the South Pacific. That role-options for their teleconferencing cannot be the same is not caused by geography and economics per se, but rather by role's need, within the context of them, to maintain integrity with its own philosophical base. If this is bridging, enhancement, extension and support, designers must take care in their initial choices of teleconferencing roles throughout the system. Some issues raised in the choosing, I believe, are also ethical.

**Planning a Teleconference Facility**

One needs, from planning's outset, to keep certain factors in mind: the location of students generally in relation to access-sites; the location of specific learning needs in relation to access-sites. Unless or until these issues are addressed, the roles of teleconferencing should not be defined. Unless or until these roles are defined, development work on instructional elements cannot proceed in a rational way. Tutor/student support systems and administrative structures depend also in their designing on this location data.

That the network's configuration relative to market and resources will suggest, or even determine, its own possible applications provides a role-design key from the very beginning.

By way of example, at Institution A, planners in the field of course design and delivery can presume that most students have access to teleconference centres. They can presume this on the basis of planned network location in relation both to students and the type of programme offered. They could, therefore (and do), produce a teaching package in which teleconferencing is integral to course design/delivery; in which it is a necessity for on-going course mastery. It, and the print, and other support materials become inseparable elements of the teaching/learning system. Its role is, therefore, primary and one of relative power.

At Institution B, the teleconference seminar could not be (and is not) integral to design/delivery. It, and the print, and other support materials are separable elements of the teaching/learning system. Designers, presuming that a large number of students have no easy access to terminal sites, produce a package in which the teleconference seminar is non-essential for on-going course mastery. Teleconferencing's role in this context becomes secondary: an available extra for those able to reach it. For both institutions, it is network-accessibility which has determined component-relations in the teaching system, the instructional design of content and the method of delivery.

**Teleconferencing's Several Roles**

There are roles for teleconferencing in Distance Education other than that of linking the teacher and the learner. Another is bridging the gap between the learners themselves, enabling peer support within the local attending group and also across distances between the sites. These benefits are both social and pedagogical. Adult students not infrequently learn much from one another, and teleconferencing by its nature creates their meeting. For an institution wishing to exploit and enhance this role, there are design implications and opportunities.

Students gathered at terminal sites can engage in local activity, be assigned and assessed in work not possible for individuals. The design of course materials can include, therefore, not only teaching strategies for the individual student, but also for students in small local groups.

To ignore - by not designing for - the local group's dynamic (which a teleconference schedule establishes and abets) not only wastes opportunity for constructive learning; it also can court destruction of the overall session's objectives. Teleconferences always run on a double dynamic : one local and private, the other plenary and public. The former can be more powerful (where the teacher is not present) and needs to be accommodated for both positive and negative reasons.

This role for teleconferencing of providing for student groups also raises the earlier issue of network accessibility. One must not, for example, at the USP, plan sessional activity which counts for final grading. Should one even, in fairness, impart essential skills? Again, the extent to which teleconferencing's role is integral must guide the choices made by designers and writers. This guiding principle must be applied also to the other possible roles of study skills assistance, and student counselling outside of the main programme.

Other than linking teacher and learner, and learners as peers, teleconferencing can usefully bridge distance for staff members. Meeting on a regular schedule for administrative purposes provides a vital bridge in decentralized operations, not only for the transfer of information but also for support of distant staff. This same support is positive for regional course tutors, meeting regularly with one another and

on-campus teachers. Again one must remember staff in centres not connected, and plan active measures to address their disadvantages.

Increasingly, both teachers and the D.E. profession are consolidating yet a new role for teleconferencing : this lies in the field of multi-point teaching. A role for teleconferencing in the development of team teaching proceeds simply, in causal terms, from technical capacity : that through the stages of planning, teaching and assessment, one can draw on the resources of distant colleagues and institutions. The effects of this capacity can be infinitely creative : enhanced content, shared workload, institutional co-operation in the interest of meeting needs beyond solo providers' resources. By enabling, technically, new distance teaching relationships, teleconferencing's role in the teaching system is both ends and means.

In each or any combination of these roles, teleconferencing becomes part of the educational infrastructure. Its impact within this structure is dynamic and can be complex. Two analogies come to mind, both domestic and simple.

Whenever my children would ask me the meaning of a word, the answer initially given would always be the same : the meaning of a word is its use in the sentence. The other analogy could be that of a new child in the family. It not only increases a group, perhaps from four to five; it also will introduce eight new relationships; it will also alter the valency of the twelve already existing.

For example, if fully integrated into course design/delivery, teleconferencing will augment the teaching package, and it will change component-relationships. It can facilitate team teaching from various locations; enable learning/assessment strategies designed for group involvement. It can facilitate the resolution of immediate content-problems, counter morale and performance impairment caused by isolation. It may be applied remedially and to project supervision. It can also raise ethical, potentially serious issues related to sessional sound-recordings (their copying, selling, replaying), to copyright generally and undeclared auditors. It will also define the potential student market, enhancing opportunities for some, excluding others completely from them.

If ascribed a structural role in counselling and/or administration, teleconferencing augments the support system and changes component-relationships. It can counter attrition, speed the flow of information, alter procedural schedules and even shift responsibilities.

One could ask, from these examples, where then lies deep dilemma, in pedagogical, philosophical or even ethical terms? From Institution B, some answers to the question might usefully be re-issued as other questions:

**Ethical Dilemmas**

How does one sustain/encourage students and teachers in teleconferences which, by course design and structure, have been defined as non-essential?

If teleconferencing is not integral but regularly provided, should physically remote students pay standard tuition fees?

If the contract made with one's isolated student is that the print is all she needs for a fair chance of succeeding, then what are the ethics of adding technology, in various forms, to sites far beyond her?

Does one aggravate and entrench her disadvantage structurally by raising the performance of her peers with network access - by counselling, group learning and regular contact schedules?

If Distance Education in some of its most effective packages can come by way of integrated design, should one choose not to produce them for reasons of equity? Should one choose not to improve and increase activity because its effect one knows, will be exclusive?

The answers to questions like these must be owned by the designers among us.

**Conclusion**

Any infrastructure for Distance Education is valid only to the extent that it facilitates and supports. It should do so both for staff and the students in their care. If it does not, then over time it can become destructive - of morale and confidence and optimum performance.

High quality teleconferencing is a powerful structural element. If we perceive it, plan roles for it, as simply a useful vehicle, we not only risk accidents on the lookout for a location; we might also predetermine the place and the casualties. However, if, beyond this delivery function, we also perceive its creativity - its power to make, or effect change in, connective relations - teleconferencing can maintain integrity with its philosophical base by not drifting into roles that are dichotomous.

For the most and even the least sentimental among us, teleconferencing's ultimate role is as an element of care. In all fields of endeavour - course design and delivery, student/staff support systems, administration - it can provide this in positive and various ways. Our choice, however, of which ways this will be determines - and thus reveals - the real object of our care.

## Distance Education at Laurentian University
## by Mr. Gerard La Freniere
## Former Director of Continuing Education, Laurentian University

Chairman, Ladies and Gentlemen I have been explicitly mandated to express to you, Dr. Irvine, and through you to the people of this conference Marion Croft's deepest regrets for not being here with all of you at this meeting. She was unfortunately taken ill on Tuesday and on Wednesday morning she felt it was absolutely impossible for her to come here. Her assistant, who is currently responsible for the distance education programme at Laurentian, is on holiday somewhere in Southern Ontario and, therefore, she asked me if I wanted to represent Laurentian. Now you may wonder why I am so familiar with the details of her health. She happens to be my wife. I want to assure you though, Mr. Chairman, that it is not in the capacity of her husband that I am here today.

I was the Director of Continuing Education for Laurentian University for 13 years from 1968 to 1983. I also participated in the early conceptualization of Contact North, which is a vast communications network in Northern Ontario which I will describe later on in the presentation. We were involved in the formulation of this organization until I was named by the Minister of Eduction to the Northern Distance Education Fund, which was the committee that made recommendations for the allocation of eight million dollars in programme development funds to the Contact North Project. Furthermore, I obtained half a million dollars of that eight million dollars to develop a full programme in business administration, all to be offered at a distance. I participated actively in the programme in the sense that I was the prime developer in two of the courses and was involved directly in the creation of six more. And I have been involved in offering five of these courses, some of which included the use of teleconferencing through the medium of Contact North network.

I also coordinated the creation of the programme which entailed the collaboration of Professors from seven Canadian universities, which in and of itself was a first in Canada I think - to try and get people from different universities to look in the same direction at the same time. I was also involved with distance education as President of the Ontario Council of Continuing Education. I was on the Executive of the Canadian Association of Universities for Continuing Education for some four or five years. I sat on TV Ontario's advisory committee, and on the Ministry's University Affairs Distance Education Committee. Therefore, Mr. Chairman it is on the basis of that experience that I dare appear in front of you today.

**Development of Distance Education at Laurentian**

It was in the early stages of the development of distance education at Laurentian that I was actively involved in that field; and it was developed despite the University and

not because of it. And that is why yesterday I kind of smiled when Dr. Lalor said that UWIDITE had reached, and I quote "a state where it is an accepted arm of the University". When he presented his brief history of the development of UWIDITE, I felt very much at ease with what he was saying because in a sense I have travelled a similar path. Change a few names, change a few locations and you have a somewhat very, very similar story. So I really believe that I understood quite well the feelings behind his words. Mr. Chairman, if I may use an expression from Penny Love's presentation of yesterday, I was therefore involved in the development of distance education at Laurentian in the what she called the gumboot period. Marion Croft has brought the distance education to the scientific level of operations as we shall see shortly. I have therefore lived the period of extreme frustration and at the same time of extremely rewarding successes.

Yesterday Claire Matthewson was complaining that she had 13% of the budget to look after 40% of the student body. I am not a mathematician but I remember that in the 1974-77 period a full 25% of the income of Laurentian University was generated by part-time students (mind you, they were not all distance education students because we were just launching the programme at that time) and yet I had access to about 5% of the University budget. I had a budget of about one million dollars out of a budget of 20 million, with about 5000 part-time students compared to the full-time enrolment of about 2500 in those days. So the development of distance education at Laurentian University was based on a shoestring budget and this did colour the choices that we had to make.

In her presentation, Erin Keough covered a number of the problems that I was going to touch on this morning therefore I will spare you the repetition. I will however try to share with you why at Laurentian University teleconferencing has become a part, but only a part, of our own distance education programme. It is due to a number of lived experiences rather than a theoretical process. We could say that it was coloured very much by the dichotomy and philosophy of distance education: the dichotomy between the institution centered and learner centered concept of distance education. We at Laurentian have opted for the latter, and thus, as we shall see shortly, the importance that we give to the creation of learning packages, of learning materials.

Mind you this is not a view that is shared universally in Ontario. For example, at the other extreme of the continuum we have the University of Ottawa which in my view is totally institutionally centered. For them, distance education is to be as close as possible the extension of the classroom experience. And this is why they, quote, "wire their teacher in the classroom" and send his lecture via telephone lines. The great difficulty that I have with that concept, and the great difficulty that we at Laurentian as an institution have with it, is that there is a very, very serious assumption at the basis of it namely that everything in the classroom is excellent pedagogy. We're not convinced of that.

Laurentian University is located in the province of Ontario in Sudbury. If you were to draw a line just south of Sudbury, 91% of the land mass of the province would be north of that line. However only 11% of the population lives there, so that of the nine million people that live in Ontario the vast majority lives in the south. We have two universities, Sudbury and Lakehead in Thunderbay, to look after this immense territory - a territory that is about five times the size of France. The area that we ourselves cover is about twice the size of France. So that in a perculiar way we could say that Laurentian's territory resembles by analogy the Caribbean. You have pockets of population separated by water, we have pockets of population separated by vast and wild hinterlands.

So the context in which distance education was developed at Laurentian was that of a small university - 2,500 students (2,300 full-time) - isolated (we are 250 miles almost directly north of Toronto). It is a small university with mainly undergraduate programmes. (We only had at the time graduate programmes in the sciences - geology, chemistry, physics and biology. Later on we added English and French). It is a bilingual university, English and French, because there are approximately half a million Francophones who live in Ontario and about 200,000 live in the area covered by Laurentian. It is a regional university. It was developed under severe financial restraint. From 1972 on universities in Ontario have been under very severe restraints, where the increases given to them have consistently been below or just about equal to the rate of inflation; so the real money available to the universities has always been less than the increase in the cost of living.

We have to deal with a unionized faculty, which can be viewed by some as presenting some difficulties in trying to introduce innovative and different things within the University. For reasons which I cannot understand, the faculty never negotiated with the University academic recognition for promotion on the merit of involvement in distance education. I am happy to report that in 1990, this spring, we now have a commitment, through a set of circumstances that I will spare you the details of, where a Professor who writes or develops a course will have it treated as though it were a refereed publication. For as you will see with our new system that was introduced by Marion Croft, it is in the very real sense a refereed publication. So this year marks, in my view, a breakthrough that should have occurred in 1972. But sometimes one has to reconcile oneself with slowness in the university context.

We also had a shortage of faculty. Laurentian University is a small university; we have departments of three, of five, of seven people. If you want to offer a programme it means that everybody is employed full-time doing teaching on the campus. Throw in the sabbatical and study leave component and you have real problems. There is just so much that somebody can do. In the last five years we have had an authoritative administration. Thank God in 1972-73 we had swung into a non-authoritative, participatory democratic bedlam type of administration. It is due to this lack of clear definition of roles within the University that I managed to develop the distance eduction programme. Simply because, as those who study or

teach about change will tell you, whenever change is produced there is a grey zone where people don't know exactly where their turf stops and another one starts. And apparently anybody who lives in a situation like this, and knows what he or she wants, can stake a claim in this no-mans land and this can somethimes produce some good results. At least it did so at Laurentian, if one believes that distance education is good. Which is not a unanimous consensus amongst the faculty at Laurentian.

During our gumboot period of development our programmes could be described as poor quality distance education product. It was a product that lacked consistency, that lacked critical analysis; so the quality of the courses that we developed in the early days was almost totally dependent upon the quality of the individual developing the course.

**Distance Education in Present Day Laurentian**

I have given you the context in which the programme was developed. The progress, the new status of distance education at Laurentian was brought about by building linkages with departments. One thing that we have concluded through a series of trial and error is that the academic content and academic responsibility must rest with the academics, if one wants the courses to receive the same respect and consideration as courses offered on campus. We had been developing courses depending on which faculty member I could cajole, blackmail, enroll - there was no strategic plan. We have now gone beyond that. We have now developed, and are developing, full programmes. We no longer develop individual courses simply because somebody has got a bright idea to develop one. When I was there the objective was to get as many of these courses into existence, and consequently it was a very haphazard development. We now provide systematic workshops to faculty members to help them in the process of developing courses. We pay faculty members for course assessment. We try as much as possible to adopt courses developed by other institutions, and whereas before there was no money available to pay someone to assess a course, now budgets have been assigned for that purpose. Now when a new programme is being developed we look around to see what courses are in existence, and have these courses assessed to see how they can fit into the programme. And where possible we simply adopt that course. We hire external course writers - we do not limit ourselves to the Laurentian faculty. If there is nobody in a department or faculty that is willing or able to develop a course we go outside, outside being wherever there is somebody qualified and willing to work on a course. We provide professional services in the form of editors and research help to the professor in developing the course. We use instructional design and, as we shall see in a moment, we have a course team with an instructional design person on everything for every course in order to help build a better product. We publicly acknowledge and recognize the contributions of people who work on the course. It may be a small thing, but at the beginning of every course it states that we recognize the contribution of this person or that person in the development of the course. We believe we have improved the quality of our products one hundred fold over some of

the earlier products because of that. And we maintain central financial control. One of the pitfalls of distance education is that costs can run away on you if there is not tight control. So these are the strategies that are currently in place at Laurentian in the field of distance education.

**Historical Background**

Briefly, distance education at Laurentian started in 1972, although in an informal way it had begun in 1970 with professors sending their notes to individual students who could then take the course at a distance. When we had about 20 or 30 students I said this was no way to run a railroad, because if one of these Professors got run over by a bus nobody would know where the student was in regard to his courses. That was when we started to institutionalize the offering of distance education. We serviced our area by sending professors to all these centres. In 1973-74 we had 24 centres in which there were over 100 courses being offered. That meant sending Professors all over the north. We did not have enough professors at Laurentian to cover the North so we would fly in professors from Toronto, Ottawa, Montreal, to various points in the North and this created a very expensive process. In one year the travel component of my budget was over a tenth of the total budget; it was in excess of $100,000. We started by offering courses by TV - then it was by close circuit TV or video television. The next year we had the good fortune to establish a relationship with the local TV system which covered more or less all our area, and we offered broadcast TV. In 1985 we had the reconstruction.

**Laurentian's Distance Education Philosophy**

If one could summarize the philosophy behind the offering of courses at Laurentian, one would describe it as a multi-media distance education system with careful selection of various technologies. It is in that sense that teleconferencing is one of the technologies that is used. So our system is not built around teleconferencing; teleconferencing is part of the process because it offers what TV does not have, what print does not have - the interactive dimension. But because of where we live, because of the vast distances, because of the small pockets of people, and because of the Canadian winter we cannot make teleconferencing a necessary component for a student to take a course. It would mean that there are a whole bunch of people living in outlying areas who just simply could not reach a teleconferencing centre at any given time in the winter. Therefore we have to adapt our system to that. So for us teleconferencing is highly encouraged but it is optional. The main vehicle for the delivery of the information is print, sometimes audio tapes, sometimes video tapes, especially if there is movement and colour that we want to transmit. But teleconferencing, because of our circumstances, simply cannot be imposed as a sine qua non condition of offering the course. Again as I said at the beginning we have moved and adopted the learner-centred philosophy of distance education. Thus the necessity of putting our effort in the design of the material and in the delivery process.

Accordingly, we have developed the course team with the emphasis on course design, the instructional design. We have invested money in professional development of faculty members so that they can be all fact with the pedagogical principles underlying distance education courses. We have insisted on, and succeeded in, maintaining a centrally administered system. We have a one address system - all communications with the students is done through the centre for continuing education. From the centre things are sent to the various parts of the University. We do not expect students living a thousand miles away from us to understand the intricacy of the structure of our University. We have established a friendly relationship with the student. Any question he/she has about finance, academic questions, library resources, anything, is channelled through the centre for continuing education. And it works. Mind you, we have had a lot of fights within the University to maintain this arrangement, but that is something that has succeeded. We provide student services which cover things like library services, which I will not spend any time on.

We believe in collaboration and course sharing. We did not always think like this. But when the government put eight million dollars in the Contact North Project, and said like a carrot at the end of a stick, you may have some of that money if and only if you collaborate - it's amazing how attitudes change and change rapidly. So we can state our belife without lying. But lets say that we were helped by filthy lucre.

In the selection of technologies we take into account certain considerations. One is accessibility. As I have just said, in Northern Ontario people do not all have access to centres in the winter time. Another is convenience. One of the inconveniences of teleconferencing is the same inconvenience of taking a course on campus or taking a course live in an off-campus centre. You have to be there at a specific time on a specific day. There is also the question of academic control. We found that using TV had a deleterious effect on the academic control of the course because you come into a conflict of two cultures. The one that I call the Cecil B Demille syndrome - the creation of wonderful television productions - and the academic decision. And it is not always possible to harmonize the two. For example the course in the bachelor of administration programme that I developed, part of it had 13 half hour sessions developed by TV Ontario. TV Ontario works on a thirteen week schedule; and like all television networks TV Ontario works on programmes of exactly 28 1/2 minutes. Well, I don't work in 1/2 minutes and my subject was not equally divided in 13 parts, but I had to adapt and it created a problem. So this is a shortcoming - the interactive capacity. Broadcast TV we find is magnificent. It reaches everybody we want to reach, but they can't reach us. Then there is availability. For example a lot of people talk about computer interactive type of technology. It's very nice, it's wonderful, it has a lot of potential. But if people do not have computers it is kind of ridiculous to pursue that stream.

And there also of course cost. The Table below is something that J.J. Sparks produced. I don't know if it is valid or not, but apparently it takes about 1.5 hours of

a professor's time to teach a student one hour in class and about two hundred hours to teach him or her one hour by computer assisted learning.

**Development Costs**

The number of person-hours of teacher time required to produce one student-hour of study

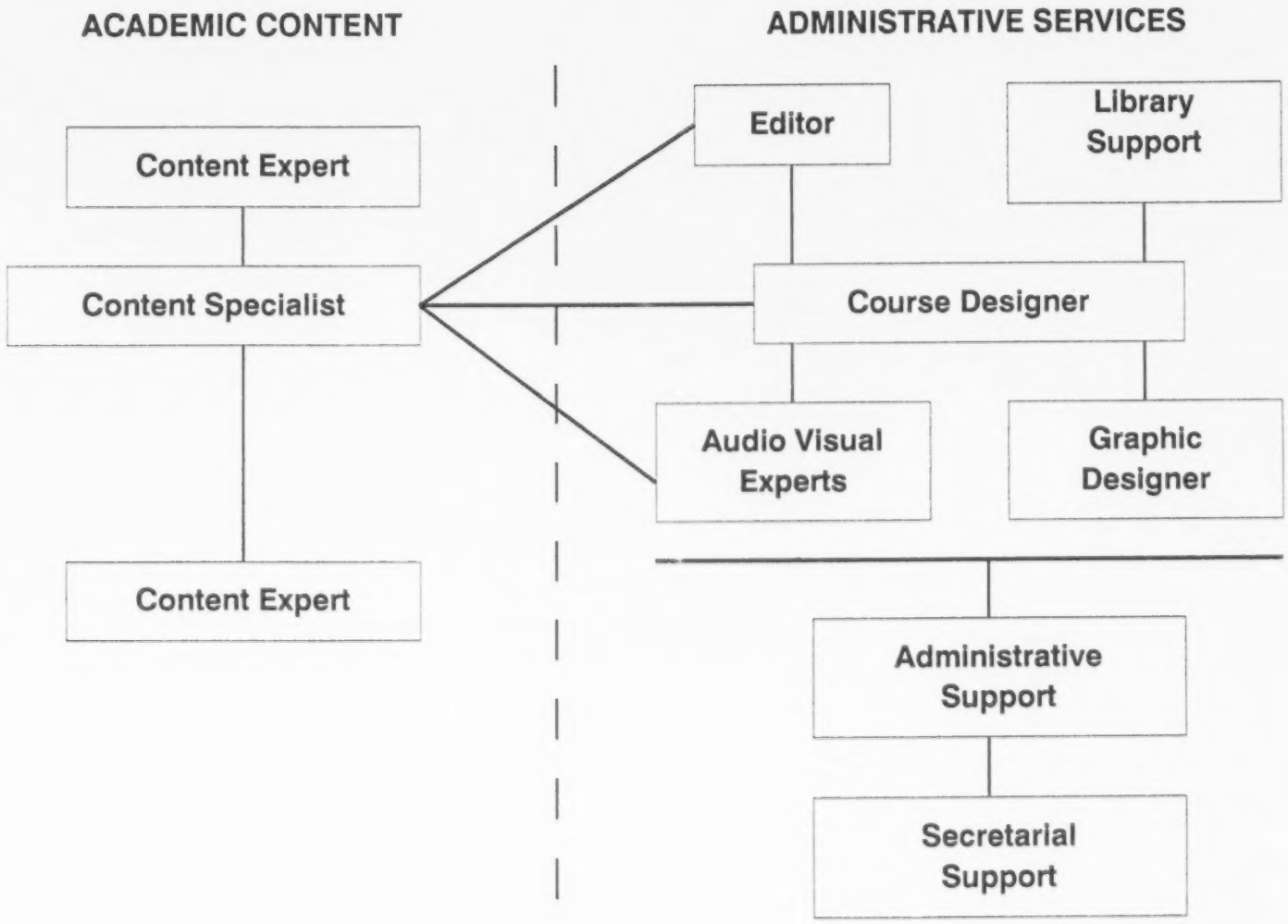
| | |
|---|---|
| Classes Face-to-face | 1.5 |
| Lectures | 2.0 |
| Radio or Audio Tapes | 6.0 |
| Television | 50.0 |
| Print-based | 50.0 |
| Multi-Media Team | 70.0 |
| CAL | 200.0 |

Of course the per student cost of any form of distance edcation depends on the number of students in the course, the proportion of the teachers' time spent, the number of the person-hours of support staff, and the overhead cost.

I just want to show you our course team concept (diagram on following page). We have firstly the content specialist. The content specialist is the prime person responsible for developing the course. We have instituted, since Marion took charge of continuing education, a mandatory examination of content by two content experts. We normally insist that one of these two be somebody from another department from another university. Now this can create problems. When I was negotiating with the Universite Lavale, which is a very prominent Francophone University in Canada, about collaborating in the development of a bachelor of administration degree, their professors - they are all doctors, they are all brilliant - would not submit to criticism of their work by other people and that ended the discussion. I thanked the guy for his cup of coffee, which was nice and warm and good, and we parted company. Because we will not accept to work with any professor, however brilliant he may be, from any university unless he or she accepts to have his/her work verified. Here we are talking about content, about subject matter and that, ladies and gentlemen, has really improved the quality of the course. Because not only does Mr. X or Ms. Y produce the course, but they have to accept that in the process of production their material is being questioned, examined by people on the basis of their expertise of the same subject matter. This is the argument that we use within the University to have course production recognized as a basis for promotion, for merit, in the same way as publications are recognized for that purpose.

In addition to the content specialist, there is the course designer, editor, library support, graphic designer, audio visual expert, plus the technical support at the bottom. This forms the course team. Since 1985-86 there has not been one course that has been developed outside of this framework.

# Course Teams



So to conclude this part, because I want to talk about Contact North. Laurentian's situation now is a multi-media approach to distance education, using teleconferencing as a very important tool amongst many other important tools. Any student can start a course by distance and change to full-time on campus - all our students have the same requirements for admission and it's just a matter of changing a slot on the registration form as to where you fit. There is no permission to be granted to transfer from distance education to full-time. In 1990, and this is to me the crowning glory of our programme, senate approved that a full degree could be earned by study at a distance. Before that we had a restriction on the number of distance education courses that a student could take as part of his degree. Now you can be living in the North Pole and study full-time.

**Contact North**

Let me say just a couple of words about Contact North. This is an experiment that was created by the Ontario government four years ago. It was to serve the northern region. It had to be collaborative - anybody who wanted to have any of the money that was earmarked for the development had to collaborate with at least one other institution; two or three others were preferred. It is a bilingual system, and it is really innovative. The environment in which it was created first of all was political. We had a minority government and they had to do something to look good and to retain their power. Since the north had not supplied too many MP's supporting the government, but they had a number of MP's support the minority that supported them, it helped to generate the new project. The geographic location, as I explained, demanded that something be done to give access to the people of the north to university and college resources. The economics of it, the costs, had to be taken into account, and also the educational aspect because in Northern Ontario we have about 50% of the youth enter post-secondary education at about the rate of 50% the rest of the province. So we have an illiteracy problem, and we have a participation problem of the young in school. It used to be easy to explain because we are an area of the country where we have natural resources and high wages. Miners, lumberjacks make big money. That was true except that the number of jobs has been dwindling and now we have a serious problem which the government has been trying to address.

So the objectives of Contact North were:

1. to improve access to formal education opportunities at the secondary and post secondary level for residents of Northern Ontario;

2. to establish a long-term capacity to improve access to other training and informal educational opportunities;

3. to meet the ongoing and emerging educational needs of residents in communities remote from conventional delivery sources by use of new information and communication technologies;

4. to meet the special needs of Francophone and native people in Northern Ontario. (Francophones have a literacy rate and a participation rate half of the population; the natives have a dismal participatory rate. So something has to be done);

5. to create new and expand existing expertise in the design and operation of technologically enhanced distance education programmes in Northern Ontario;

6. to create models for the alternate delivery of educational services capable of:

   a) application more broadly throughout Ontario;
   b) application to the needs of other jurisdictions, including developing countries.

7. to create a "test-bed" to evaluate the effectiveness of various technologies in delivering distance education.

Contact North is a network that started four years ago with 18 sites; it now has over 100. Contact North is a communication system. Through that system high schools, colleges and universities offer diploma, degree and certificate programmes. It is strictly a northern organisation developed in a collaborative way with universities from the South. For example, Lakehead University and Waterloo University developed a programme in tourism through this Contact North initiative. It is bilingual, it is innovative.

Mr. Chairman, I would like to thank you for your attention and the care with which you listened to these remarks. Thank you very much.

## Teaching by Distance at the University of Waterloo
## by Dr. Christopher Knapper
## Director, Teaching Resources and Continuing Education

The clock is ever present. I remember being at a conference in Japan which had one of the most sophisticated, draconian systems for policing speakers that I ever came across. It was a little device which sat right on the rostrum and had three lights, like traffic lights, a red, an amber and a green. As long as it was green you could continue to speak. The amber light flashed to let you know you had five minutes more. And then there was the red light. The trick with this was when the red light came on, all the lights went out. And the microphones went off and wouldn't go on again until you had removed yourself from the platform. Whenever I have mentioned this at a presentation there is always a sympathetic murmur from the audience, and I noticed that this audience was equally sympathetic.

Some people have asked me where Waterloo is - after they have ruled out Belgium. It's in that rich, prosperous part of Southern Ontario. We are a much more conventional institution.

Let me begin by saying something that is a little bit shocking given the context of this conference. And that is that we don't do audio teleconferencing at all. We have a system that is a very traditional correspondence programme. You may say, "Well, why on earth are you standing here speaking for three-quarters of an hour when you are not even doing audio teleconferencing?". Well, I think the point of inviting the University of Waterloo was to find out perhaps why we don't. And I would like to raise some of those in my presentation.

**General Background**

Like the other speakers, though, I do need to first give you a little bit of information about our institution just to give a context. I know that is sort of boring - parading the old familiar facts about where it is and who we are but, if you'll indulge me just for a few minutes, I would like to put it into that type of context.

The University of Waterloo is a fairly large institution; we have about 25,000 students. It's 32 years old. It's well known to some of you for its programmes in engineering, mathematics and computer science. As far as distance education is concerned it began in 1968 and it is a big programme. We have about 18,000 student courses, that is 18,000 students in distance courses in any particular year. Of course that is tiny compared with the Open University which has hundreds of thousands. But by Canadian standards that is very large. To give you an idea of how that fits in

with the general University, about a fifth of the total undergraduate enrolment is in distance education and in one faculty, our big player in distance eduction, which is the Faculty of Arts. About a quarter of all enrolment is in distance education. So that means that it is a fairly significant component of the University.

We're also very large in the fact that we offer a vast number of courses. I almost presume to say - although somebody here could perhaps prove me wrong - we must offer among the largest number of courses of any university in distance education in the world, I would hazard, at 325. You can get three degrees entirely through distance study. I should mention that we have a small programme in the Caribbean with students who have completed degrees from Waterloo entirely by distance study. So far, to give you an idea of numbers again (this is small beer compared to the Open University), almost a quarter of a million students have passed through the Waterloo programme. I don't mean 212,000 students have got degrees of course, but they have taken distance courses from Waterloo.

What are the areas we specialize in? Well, Arts and Humanities is the biggest component, but we also offer complete degrees in science; almost a complete degree in math, which is very unusual. Waterloo has an entire faculty of mathematics; it is very big on teaching mathematics. We also offer a degree in environmental studies. We have recently gone to certificate programmes; they were actually developed through Contact North. Although this may surprise you, all that network that Gerard described of electronic communications - we do not use at all. We develop these programmes through Contact North but they are completely traditional programmes. They were developed in conjunction with Lakehead University which is Laurentian's sister northern University.

Lastly, we have a common instructor. That's nothing to do with his ancestry, I mean the same instructor for on-campus and distance education courses.

**Distance Education at Waterloo**

So our model is a very traditional, dual mode model, in which we don't have course teams, we don't have all the sorts of things that the Open University has. We are very traditional - home-spun might be the word to add to gumboot, which seems to be a metaphor which has really grabbed hold of the conference. That is both of course a weakness and a strength to have the same instructor do both. The weaknesses of that were pointed out by Gerard; the strengths, I think he would agree, are that of course it has a sort of cachet among the consumers of distance education to think that they are getting instruction from a real professor, a real lecturer, and not just some special person who is only employed to do distance education. So there are advantages and disadvantages in that rather primitive approach that we have at Waterloo.

Who are the students? We actually have done some research to find out who our students are and the Table on the following page gives you a snapshot of the typical Waterloo student. A but slight majority female, early 30's, mostly married and with children, mostly employed in professional occupations, quite a large number of teachers.

## Student Characteristics

* 56% female; average 33
* 67% married, most with children
* 79% employed, most full-time
* Most white collar, 30% teachers
* 77% from Ontario, 37% in large city
* Median miles from a university = 20
* 29% have some university, further 30% have a degree (40% for males)
* 53% aiming for degree, 26% study for interest, 15% for upgrading
* Study time per course 8.5 hours (range 0-40 hours)
* 87% very satisfied with distance study

You can take a Waterloo programme from anywhere in Canada. If Erin will forgive me, we have some in Newfoundland who take Waterloo courses, and we have people on Great Lake steamers who take courses - they don't use ship to shore radio to do that. We have a Mountie somewhere up in the ice covered wastes of Northern Ontario who takes courses, and we tend to keep tabs on him because he is so romantic as a distance student. But most of our students are very mundanely living in Toronto or Waterloo. They live in very large population centres and, in fact, they live very close to a large city. So we have, if you like, the exact opposite picture from what many people here have been describing - and it's a bit of an irony, isn't it? Everybody here so far has talked about the tremendous need for distance education because you don't have access to a university at hand, whether it is in Northern Ontario, the South Pacific, the Caribbean, parts of New Zealand. The funny thing is that even when you live right by a university, there are hundreds of thousands of people who would prefer to study by this means. I think that is another part of the equation. I don't want to go into it in great depth here, but I would point it out simply because I would want to argue that the distance in distance education is not

necessarily primarily a matter of physical distance. There is another type of distance involved which I would like to call psychological distance.

The second reason for pointing this out is that there is a credibility of distance education, I would wish to argue, that transcends necessity. In other words, if you believe that people think it is a second best eduction, there are 212,000 people that have taken Waterloo courses that would prove you wrong. Most of those 212,000 people could get on a bus or hop in a car and go to the University of Toronto, and yet they have still opted for this type of education. Furthermore, these people are not idiots because most of them already have a very high level of education. In fact most of them are already university educated or have a degree. I mention this because I want to point out that distance education has considerable credibility amongst people who have other experiences of higher education. I think that it is important for you to recognize that distance education is not something that only people who cannot get to a proper university take advantage of.

This of course for us is a problem. I'm not sure if we want in Canada to be giving more and more education to those who are educational junkies, which is what these people are. They are the people who go to conferences with a pile of textbooks in their briefcase because they are scared to death to be caught without reading matter - like me.

Why are they taking distance education courses at Waterloo? Well, about half are taking them because they want to get a degree but the rest of them are taking them out of general interest, or because they want to get a couple of courses related to their profession. There are a mixed number of reasons for wanting to take distance courses.

They study on the whole about 8 1/2 hours a week for every course they take. I would like you to bear that in mind when I talk about St. Vincent, not the man but the island, a little bit later in my presentation. The range, of course, varies tremendously from 0 to 40 hours. Most of the people who take the courses are quite satisfied with distance study.

How do we go about distance education? Very traditionally, is how we go about it. I'll just mention the highlights here. First of all we have a paced programme. There are great arguments in the distance educational literature about whether you should have a programme which is paced, that is that has a fixed beginning and end at certain points throughout. Or whether you should have a laissez faire approach and let people submit their assignments and take exams whenever they feel up to it. If you have read the great guru on distance education, B. Homburg, you would know that he claims that proper distance education has to be unpacked. According to him, it's not really genuine if you put this artificial restriction on it that you have to do things by a timetable. I won't get into the why's and wherefore's of that. We might talk about it in discussion, if anybody is interested. Our programme is a paced one, I

must say not because all the instructors at Waterloo read and rejected the writings of Homburg, whom they may never even have heard of, but purely because that is administratively convenient for the university.

We use an approach which would best be described as a course in a box. It is a very primitive approach. And here is the box. I'll actually show the box to you. If you were to register at Waterloo, you would get this package and that is the course, assuming Canada Post have not lost it, which is increasingly a problem for us. The box would open up like this and it would contain this selection of material. First of all we assume people need some instructions as to what to do with the materials, so there is a little pamphlet saying "Read this first". About 40% of the students don't, as far as I can see, but it's on the top and it tells you how to deal with the material that is in here. It gives addresses of people at the University, and so on. There is then the course notes which is, if you like, the print manual. And then there is a compendium of audio cassettes which just pulls out like this. And all courses have a set of audio cassettes. These are prepared specially. We don't just record somebody in a classroom but they roughly correspond to the lectures you would get in on-campus teaching. There are no fixed number of cassettes but most courses would have a full box. There would be two sides to each cassette and each side would be about 40 minutes duration. The cassettes are recycled. The student sends these back to the University when they are finished and we then monitor them and send them out to the next students.

The other thing that is in the package, the other important component, is a set of six envelopes and these are for assignments which are set at regular times throughout the term. These assignments are completed and in most cases mailed back to the University. I say in most cases because I want to later briefly touch on an alternative method we have for dealing with assignments. It is very new and innovative and involves sending them to us by computer instead of putting them in an envelope.

So that is the course. It would also have textbooks which are sent out separately but, in a sense, it is a course in a box and that's the box. By the way the box unfolds and folds the other way around and it says on there, University of Waterloo, and you mail it all back to us. So it is a very simple system for dealing with distance education, low-tech, I would say.

What are the other components? We do have a kit in some instances. Sometimes if you are in certain courses you would get a box with rock samples or slides or something like that. We are increasingly making use of video tapes in some courses but only to demonstrate things that are difficult to do in print or on an audio tape. We would never use a videotape just to present a Professor talking, although many Professors would like us to do that - they all see themselves as potential TV stars. We have a rather different view.

Distance education students at Waterloo pay the same fees as on-campus students and they are treated in the same way. What I mean by that is the same admission standards apply, the same promotion standards apply, the same exam, appeal and that sort of stuff.

In theory courses are reviewed with a view to re-preparation after four years. I must admit that some aren't, but thats the theory. Assessment is by assignments - which generally count for 60% of the grade - which are marked, sent back to the student through the mail system; and by final exam. We have about 114 exam centres right across Canada. Students go to these to write their exam on a fixed day and so on.

We don't have (this sounds terribly poor compared with Laurentian) course teams. We have an autonomous individual instructor. We have a sort of course design but, in my view, it is very difficult to get an arrogant, qualified university Professor in a dual mode institution to be persuaded by somebody with no power or money to have his or her course designed, when that individual is perfectly confident that he knows everything that could possibly be known about how to prepare any type of course. Of course he doesn't, in my view, but it's a problem and it's not one that we have tackled as well or as successfully as Laurentian. So we have limited course design.

We use tutors extensively but not to do tutorial work, mainly they do marking of assignments. We have very limited opportunities for interaction. I'm telling you this because it is breaking all the rules that you have been hearing so far. There is very little interaction on a person to person basis between the instructor and the students. The students can of course phone the instructor or even come to the University, if they wish, but not too many physically show up.

We have a number of devices for communicating with students. We have the phone call that I mentioned. Since many students live quite close to the University they can actually visit the University and see the instructor. We have days when we invite correspondence students to the University. We have regional networks which are run by volunteers. These are groups of students in major centres (major centres meaning whether there are sufficient numbers of Waterloo correspondence students to warrant it) who meet on a volunteer basis not organized by the University of Waterloo. We just provide a sort of facilitating service for that. We have a newspaper, which we send to every correspondence student every term. We have open house visits where our staff go out to centres. We have tried audio teleconferencing, despite the fact I said we didn't do it.

Amazingly, the numbers of students who partake of any of these interactive devices are less than 10%, so I am giving you a sort of counteract, if you like, to some of the stuff you heard yesterday. Very few of our students take advantage of the opportunities provided for interaction with the instructor or tutor or with other students. Now I hasten to add that this opportunity is a voluntary one; we do not insist on attendance at any of these things. But I raised it because I think it makes an

interesting point about the characteristics of distance students. This is something that we have done a little bit of research on. Many distance education students at Waterloo suffer from what might be called the Greta Garbo syndrome, which is "I want to be alone, I don't want to be forced to interact with other people or with the instructor, particularly. I would like to be able to work by myself according to my own schedule". I think that we have to be aware of that attitude on the part of some students. Now of course the dilemma is maybe they shouldn't be allowed to, maybe we should insist that they interact just in the same way that if you have students in a classroom. You may wish to say to them, "You have to take part in discussion. I am not going to have you sitting quietly at the back just listening to me". So we tried summer schools and we tried teleconferencing. They didn't really work for us and we abandoned them.

**Issues and Problems**

Now a few issues and problems that we face, and I'm sure other institutions face too. Withdrawal rates - that is something we all need to pay attention to. Our withdrawal rates at Waterloo are around 35%. We think that's too high, but despite extensive research we have had very great difficulty in pinpointing the cause. We have never come up with an answer to that withdrawal that satisfies us, so withdrawal rate is a problem.

The question of course quality is an issue which has been an underlying theme throughout the conference so far. That is partly the issue of how much do you design a beautiful course package or a beautiful course experience, which would be for example the Open University approach, and how much do you play it by the seat of your pants, which in some ways is the Waterloo approach. I don't want to overemphasize this, but just for the sake of contrast let me say that that's what we do. For reasons of time I won't go into this quality thing at great length but just let me say, or echo, what somebody said yesterday. It is an amazing thing that students succeed despite what experts regard as rotten course materials. It has always been an amazing phenomenon to me that students, not only distance students but students in real university courses, succeed despite the most abysmal teaching. I sometimes think they succeed because of the abysmal teaching, and because they are, if you like, thrown on their own devices. So I am not convinced that having a terrifically articulated, well put together package, whatever form that package might take, leads in all cases to the most satisfactory pedagogical outcome. I say that perhaps just to be deliberately provocative and hope somebody might wish to argue with it. Certainly our students seem to succeed very well, including some students from the Caribbean.

There is also linked to that the issue of sophistication versus simplicity. In relation to audio teleconferencing, for example, it worries me a little that you might go to a very complicated system and make it more complicated than it really warrants. There is a sort of value to simplicity and flexibility. I don't know whether any of you know of a

book written some years ago by a man named Wilber Schramm, who specialized in writing about education in developing countries and he called his book "Big Media, Little Media". He makes the argument that really big media are fine and dandy and very impressive but they lack cheapness and flexibility, which may be the very things that allow education to succeed in developing countries. And I think that even in developed countries like Canada there is a merit, sometimes, in cheapness and flexibility.

I would argue, for example, that despite the discussion we have had on technology in the last two days you would be hard put in cheapness and flexibility to replicate a paperback book. You can put it in your pocket, you can take it anywhere, it is a fixed record, you can mark it, annotate it, read it on the bus; and an audio tape comes in a quite close second. It is a very flexible and very cheap type of medium. We also use more sophisticated ones at Waterloo so I don't want to say that cheapness and flexibility are everything, but I think they have to be taken into account in any planning of distance education unless, of course, you have an absolutely unlimited budget. I haven't heard anybody at this conference yet who does, but perhaps we will find out some examples later.

I mentioned student attitudes and motivations. This was the point that distance students are always thought to crave the opportunity for interaction. In my view, many students don't, although I take note of the fact that Caribbean students might be different in the sense that the loneliness of the long distance learner that Gerald Lalor referred to yesterday may mean that there is a sort of yearning to meet others in the same boat. I also acknowledge that the motivations of distance learners are many and various and it is a mistake to tar them all with the same pedagogical brush.

I am particularly interested in whether education can foster independent, autonomous, self-directed lifelong learning and have written about that, not particularly in the case of distance education but in the case of on-campus students. Do universities make for independent decision makers, problem solvers, who can solve all these multiplicity of problems facing the world today? My argument in the case of on-campus instruction is that we do a pretty bad job in traditional universities in doing that. Because so much of our teaching is teacher centred as opposed to student centred. In other words you have a Professor who says "I know everything and your job out there is to master what I am telling you and to give it back to me. And if you do it really accurately, if you reflect my views and my prejudices and my biases and I can see that when I mark your exam, I will give you the good housekeeping seal of approval and your diploma will be stamped appropriately". I am very cynical about that, and think that that does not really do very much service either in Canada or Jamaica.

I am also concerned that we teach skills that are really academic skills as opposed to life skills. The discussion yesterday about access to libraries, and I forget who it was was saying we try to get students to use resources in the local communities. I think

that is exactly what needs to be done. Most professionals, let alone non-professional university graduates, are not going to spend their lives consulting things in university libraries and citing reference lists according to the American Institute of Physics citation standards. And yet we spend an awful lot of time in conventional higher education teaching those skills. And we spend an awful lot of time worrying in distance education that our students don't have the chance to learn skills which, I am arguing, are useless anyway. So I am sure some of you will want to argue that later but it is a point I raise here: Does distance education encourage independent, life long learning? I think that it has the potential to do so if you do some of the things which Erin was referring to yesterday; you throw students back upon their own resources. But if you convey through your box, or through your didactic lecture coming over UWIDITE, that the fount of all wisdom is in Professor J and that you have got to sit quietly back and master that, then I don't think distance education fosters independent lifelong learning.

The question of faculty attitudes is one that Gerard referred to. I think I'll skip over it here. It is just the question that faculty in dual mode institutions like UWI and University of Waterloo really have their value system somewhere else than in doing distance education. They are rewarded for other things, their training is in other things, and this is a problem I think which bedevils doing distance education in the most effective way.

The question of pedagogical effectiveness is: do distance education students do as well as on-campus students? Is it as effective as on-campus teaching? I think that is impossible to answer, in a way, and maybe it is the wrong question. I would however argue that distance education can provide very effective learning. It is a different type of learning from on-campus learning. I am not very sanguine about on-campus courses anyway, so perhaps that is not the model we should be using.

I just want to mention a few, if you like, side issues. One is St. Vincent. The University of Waterloo for about six years has had a very small programme, sort of a volunteer programme, on the island of St. Vincent. It can be described very simply. I won't give you the origins of why we got into that, but what we do is send the boxes to St. Vincent instead of sending them to Canada. That presents incredible logistical problems because of the nature of mail delivery in the Caribbean. The students open the box. They do exactly what a student in Canada would do. We make no special provision at all for the fact that these students are in St. Vincent. There are a very few students in the programme; we are talking about a dozen. I only mention this because that defies every rule - what's in this box is prepared for Canadian students, it's not culturally tailored, no provision is made for interaction, nothing of any of the rules we have heard about in the last two days is taken account of in this experiment.

Amazingly, those St. Vincent students have done astoundingly well under those really impossible circumstances. And I am pleased to say that the programme has been going for five years, and at the last convocation at the University of Waterloo the first

two students from St. Vincent graduated, having completed their degrees from the University of Waterloo entirely by distance study. They never visited the University of Waterloo during that entire period, and they were known to us only through the mail. They were treated the same way. The instructors didn't know they were in St. Vincent. Their stuff was marked in the same way. Now I am not arguing that that's a model that should be imitated by the UWI or anywhere else. I am just saying that that's incredible, because to complete a University of Waterloo degree in five years entirely by distance study is almost an impossible feat for a Canadian student. We hardly have any students who have ever done that. It means that you have to take two courses every term for three terms a year in order to do that and not fail one of them. Those students, the two who graduated, did that and they were both fully occupied with work. In one case a paid job, and in the other case an even more onerous unpaid job of a lady who had five young children that she was bringing up while she studied for the University of Waterloo. It is an unbelievable story to me.

There is one other side issue I would like to raise. Technology. I have given you a low tech description so far, but Waterloo is actually a highly technological sophisticated university and there is one experiment that has been very successful for us. Which is, as I mentioned, to use computers to communicate back and forth with the student. I won't go into great detail because of time, but effectively what we do is an introductory computer science course. It has been running now successfully for three years. We send the student a lap top computer and printer through the mail. The course is taught by tapes and in exactly the same way as normal. But the assignments are done on the computer - they are computing assignments, so it makes sense. The computer has a modem which is plugged in to the telephone line; the assignment is downloaded to the University of Waterloo's computer. It comes back marked from the University. That has worked very well for us, and I gather from the Computer Science Department that developed it the protocol for doing all that would be donated to anybody who wishes to use it. We can't donate all the computers, but we can give you a way of getting it back and forth, which we have tried out now and believe works well. We have had very high completion rates in those courses. I mentioned 30% withdrawal rates earlier; we've been getting 95% of people completing those courses. We have very rapid turn around and it has been a very successful programme for us.

**Audio Teleconferencing**

Let me end with a series of conclusions about audio teleconferencing. I know I have not been talking about audio teleconferencing, but this is what I would like to leave you with, which speaks more to the theme of the conference. I think audio teleconferencing has some advantages and I think it has some disadvantages. These have nearly all been touched on by other speakers.

**Advantages**

Interaction is the one that everybody has mentioned. I think it was Professor Lalor who spoke about "combatting the loneliness of the distance learner". That is of course and advantage of audio teleconferencing.

It is often thought that oral communication is more friendly. In fact people talk about our audio tapes as being more friendly and personal than print. The other thing is that I've heard it said that people in the Caribbean like to talk more than they use print and, therefore, if you have a speech based system it may be easier for people to use. (That may be true, I don't know if there is any proof of that.)

Audio teleconference is "cheapish". It is relatively cheap compared to, say, TV. It is not dirt cheap, though.

It builds on the university oral tradition. I don't know if any of you have read a book by Lord Ashby, a famous academic from the University of Cambridge, "The Fourth Revolution". These were revolutions in education that had taken place over the history of man/woman/humankind. He came up with these three revolutions. I'll tell you what the Third was - it was the invention of print and the printed word. He said that that was terrific because it meant that people did not have to rely on oral communication. He talks about how monks in the old days, since there was only this one handwritten book, had to go to a rostrum and read out for the edification of the audience these mystical words. Once you had printed books that was no longer necessary. And then he talks about the Fourth revolution, which is educational technology. I was thinking, "Just a minute, here, universities as far as I can see are still in the second revolution because they are still (at least at the University of Waterloo) reading from the sacred text". I wondered whether or not we really are aware that the Third Revolution, let alone the Fourth, took place.

**Disadvantages**

I think that if you have a system based solely on audio teleconferencing, you neglect very simple, effective, alternative media, print in particular. I single out print because it is very cheap and also because print is the dominant academic medium. I know people talk a lot about what computers are going to do, but professionals and academics spend an awful lot of time dealing with print. And so I would argue that a system of education that doesn't use a fair amount of print - that's based purely on oral communication - is going to disadvantage the student in some way.

Some students are going to resist participation. And as Claire pointed out, some students won't even have access to the nodes or a telephone and that produces inequity.

Faculty may underestimate difficulties. I said earlier that it builds on oral tradition. I think that that's a disadvantage, too, because I think faculty think that all they have to do for audio teleconferencing is come in to a studio and 'wing it' for an hour. That's what they do in the classroom so that's what they do over the network. They don't realize that there is a lot more involved than that.

Costs, of course. I said it's cheaper than some media but it is also more expensive too, particularly when you have to set up a complicated telecommunications system.

We talked about the inflexibility of real-time communication. If you have to have people in a particular place at a particular time, that immediately limits the access because people have got to make special arrangements to be there.

Finally, the more philosophical point. I think, if you are not careful, audio teleconferencing can simply reinforce a system of education which is teacher dominated, teacher centred, as opposed to dispersed and student centred.

Those of you who know a very interesting, rather weird Canadian Prime Minister called William "Lion" McKenzie King, I'm going to paraphrase a famous remark of his in describing audio teleconferencing and say: "Audio teleconferencing if necessary, but not necessarily audio teleconferencing".

## Presentation on the Open University by Deputy Director, Institute of Educational Technology, Dr. Judith Calder

I was particularly pleased that a representative of the Open University was invited to this conference because I think it is important that we all share our experiences. One of the things that intrigued me was the fact that we were invited as resource persons. I thought that that was very interesting because that is just the sort of very positive way of looking at the way we can be learning from each other.

You'll notice that I brought with me a cross section of materials to try and indicate the range of courses that we are currently producing. I have tried to cover a range of topics, a range of audiences from different programmes and using different media.

Usually speaking after lunch is very much of a challenge, but I am reassured by the look of intelligent interest on everybody's face. I won't have to play any music at any point to wake anybody up, I'm sure.

The three areas that I want to try to cover this afternoon are:

1. to indicate the range and potential of distance education;

2. to look at the Open University's experience of the strengths and weaknesses of some of the different media. We've heard about some media from other speakers. In particular I will be looking at print and audio-visual materials;

3. to look at some of the key issues that have emerged as important in the provision of distance education.

**Distance Education**

If I could just say a few words about distance education, then. I think it's particularly important, and it's emerging as important, because it is being used very much as a way of introducing change into a society. Change is accelerating and societies are having great stresses placed on them. Individuals in those societies have great stress placed on them. So distance education is actually helping people to cope with change. It is also a force for change in its own right because it can reach mass audiences, geographically remote audiences, and it can also reach members of groups who are dispersed through the community - specialists, as we have heard in earlier presentations.

It is also very flexible. When you talk about distance education you are not just limited to distance in place - geographically distant - but you can be distant in time. The teaching can have taken place at a totally different time than the learning. And that's actually very important.

It's also efficient both for individuals and for communities, because people can be continued being in paid employment while they're studying; they can continue earning, contributing to the economy; they can continue caring for dependents. We have a lot of house-bound students who are registered with the Open University. It's the only way that they can possibly study.

It's also an empowering medium in that it enables adults to gain confidence in their own ability to cope with learning. From the feedback from students that we get, one of the things that keeps coming back - whatever the level of course or type of course - is the greater self confidence that they have acquired through the learning experience. They've taken responsibility for their own learning, they've gained confidence in their own ability to be able to think critically, to be able to articulate their opinions. So distance education is a very powerful form of education.

And yet, when we use the term distance education, it sounds as if we are talking about something that's a homogeneous thing. And it's not. What is impressive about distance education as a label is the diversity of provision that is actually encompassed within it. The diversity of institutions (and we've seen some of those already) - from those like the Open University, which are exclusively distance teaching institutions, right through different combinations to those who are primarily face-to-face institutions but with some distance teaching component.

And diversity of provision within institutions, so that you get the range of courses; the range of programmes that those courses are offered within; the types of qualifications that are offered. At the Open University we offer everything from, at one end, Ph.Ds, Masters degrees, right through to providing packages for the barely literate to study.

The forms of distribution vary enormously. We've focussed to a certain extent in this conference on teleconferencing. But there are a whole range of media that are used, a lot of which have already been indicated - print, TV, video-based, audio-based, computer-based, home experimental kits. So there is a whole range of ways of actually distributing the courses once they are developed and produced.

**Distance Education at the Open University**

So where does the Open University fit into this range of distance teaching institutions and distance education? There are five primary characteristics of the University. Its students are adults. Now all universities take students of 18 years and over. But we

take students of 18 years upwards - I think our oldest student so far was 93. Our oldest graduate was about 96. People do keep learning throughout their lives.

The courses are very much for part-time study. A typical undergraduate course takes between twelve and fourteen hours study per week. We're based on the American credit system so that students need six credits for an ordinary degree, eight credits for an honours degree. So through part-time study it takes about six years to acquire an ordinary degree, that's of twelve to fourteen hours study per week. So it's no easy option. It requires commitment and determination on the part of students and its just amazing that so many people do actually survive and thrive on such an experience. The learning is primarily home-based. That's how it's organized. The teaching uses a variety of media.

Perhaps most different from other institutions, entry to all its courses is open to all. There are no qualifications demanded as a precondition. One of the sadnesses that I experience is the fact that it's this particular aspect which is least copied in different institutions around the world. Other institutions have tried distance teaching modes but, as far as I am aware, there don't seem to be others who are prepared to take students on to degree courses with no qualifications. But we have right from the very beginning.

What is the University trying to achieve? I think the philosophy behind the setting up of an institution is very important in understanding the way it develops and where the priorities are. There was a threefold objective behind the University when it was set up that determined the way that it initially developed.

First of all, it being media based. I quote from the charter of the University "that it shall seek the advancement and dissemination of learning and knowledge by teaching and research, using broadcasting and technological devices, correspondence tuition, residential courses, seminars". So it's actually built into the charter that it should be using a range of media right from the beginning.

It was also stated that it "should provide education of university and professional standards for its students". So it wasn't going to be a second class institution, a college which was offering somebody else's degrees. It offers its own degrees. So that determined the level of the courses.

And finally, it was to "promote the educational well-being of the community generally". And it is because of that instruction that we look to extend our range of audiences, not just on an elite group but to try and reach as wide a range of people as is possible.

The charter determined what the University would provide, how it would be provided and for whom it would be provided. So the three priorities that we follow are to:

- extend access
- provide a breadth of courses
- provide courses of high quality.

I want to focus on the quality of the provision. But I'll just say a few words about the other two. In terms of access, the initial concern when the University was set up was would they get any students. I'm conscious that twenty-one years ago the few members of staff who were appointed wondered if they'd have any students - they were setting out in the dark with no knowledge of what was going to happen; they were in the middle of divising the four foundation courses but there were as yet no students. Was it viable as a form of study and for the sorts of fees that they were charging?

Well, if I say that in the 21 years since we started we've had over a million people take our courses, I think that describes the success, in number terms, of the University. It was a slow build up. We started off with 20,000 in the undergraduate programme. Since then, for the undergraduate programme we've tended to have twice as many applicants as we could actually take. But we've also developed other programmes.

The later concern, once we'd shown that there actually was a demand for this type of course, that it did meet a need, was "Was it just for the middle classes?". We didn't want it to be another elitist university. One of the problems in Britain, as I'm sure you are aware, is that while the middle classes are well served by higher education, the working class and those in the lower socio-economic status don't do very well from the system. We wanted to reach out to them - it's just as much their university. We've had partial success, I would say, and that's one of the problems that we've got to face. We've introduced a variety of special schemes which include prisoners - we have people in prisons studying our courses (not the science courses, I hasten to add; they're actually not allowed. Once they saw the chemicals as part of the home experiment kit they decided that was tempting fate). We have people in hospitals; we have seamen - people at sea; we have at-risk parents - those are people who are in danger of battering their children - our materials are used in groups with these students to help them discuss issues. So we reach a broad range of people.

That brings me on to the breadth of provision. For the first four years we were only providing undergraduate courses. Then came the associate student programme. Those were the people who just wanted to study one of the courses, one credit, they were not interested in building up to a degree but they were particularly interested in taking a course. So that was allowed and they were called associate students and they had to pay more for the privilege.

The Open Business School is a relatively recent development. It now has 10,000 students. But for three years people were trying to find funding to develop courses in that area because the government wouldn't fund the development there. So it had to be entirely through private development money. Professional development areas include teaching and health and social welfare. We do research and higher degrees; scientific and technological updating; and family, community and personal interest courses; and contract training. If you like, the University is burgeoning in the types of courses that it is now producing. It's at an exponential rate - it started off slowly and has been gathering more and more speed over the last few years.

All this may sound as if it is very positive. But the funding basis has changed. Initially, for the first ten years, we were almost fully funded by the government but for the continuing education area - that's for the non-undergraduate provision - we were supposed to be self-financing, those courses were supposed to pay for themselves, and our courses are quite expensive. So what has happened is that the new provision has been what we call "cheque-book led". It means that where money is available, which is in science and industry, we can get sponsorship either for developing the courses or we can get sponsorship for the students. So for a very prestigious looking course in management, with manuals bound in leatherette (so it looks good on the manager's bookshelf) most of the students taking a course like that would be paid for by their employers. But if you take a course like the one which is about dealing with mental handicap for people who have the mentally handicapped in their families, or for voluntary care workers - there is no sponsorship for these people. They have to pay the full fee themselves. Nevertheless, we do get a few courses like that through. But it does mean that the new courses tend to reflect the prevailing political, social and economic concerns of the government, rather than the identified learning needs of disadvantaged groups within the community. That's a temporary situation, I hope, and it may be that that's entirely appropriate but it is something that you need to be alert to.

Now I wish to go on to looking at the quality of our provision and how we achieve it. There are two aspects to quality: one is the academic content, the other is the teaching process. We have to look at those two separately.

If we first have a look at the content. The term course team has been mentioned a number of times and, of course, that is a style of development that we are actually very fond of and major courses are all developed in that way. So, for instance you have:

- the Course Team Chair, who is responsible for the academic and educational quality of the course, and for keeping to the scheduled budget;

- the Course Co-ordinator, who is a junior academic administrator, who is the person who has the unenviable task of going around chasing everybody to make sure that their draft materials get handed in on time;

- the Course Unit Authors, who may not necessarily be internal OU staff.

I think one of the strengths of distance teaching and of print based production is that you can use experts wherever they happen to be located. So if the leading experts on, say, fresh water fish are at Manchester University, you can invite them to join the course team as consultants to give their expertise to the course, to write for the course. So that means once the course is developed, it encapsulates the latest thinking, written by the experts themselves, not just the experts who happen to be employed by the Open University. So we draw on academics from all universities in order to try and get the most up-to-date and the best contributions.

- the Staff Tutor. This is the person who is responsible from the centre for the tuition and counselling aspects of the students. They are in a sense looking after the students' interest in the development of the course.

- the Educational Technologist (or Instructional Technologist), who is concerned with making sure that people actually try and think about the aims and objectives of the course - what it is you are trying to achieve, the developmental testing of the material (if we can organize that), the assessment, the evaluation of it.

- the BBC Producer.

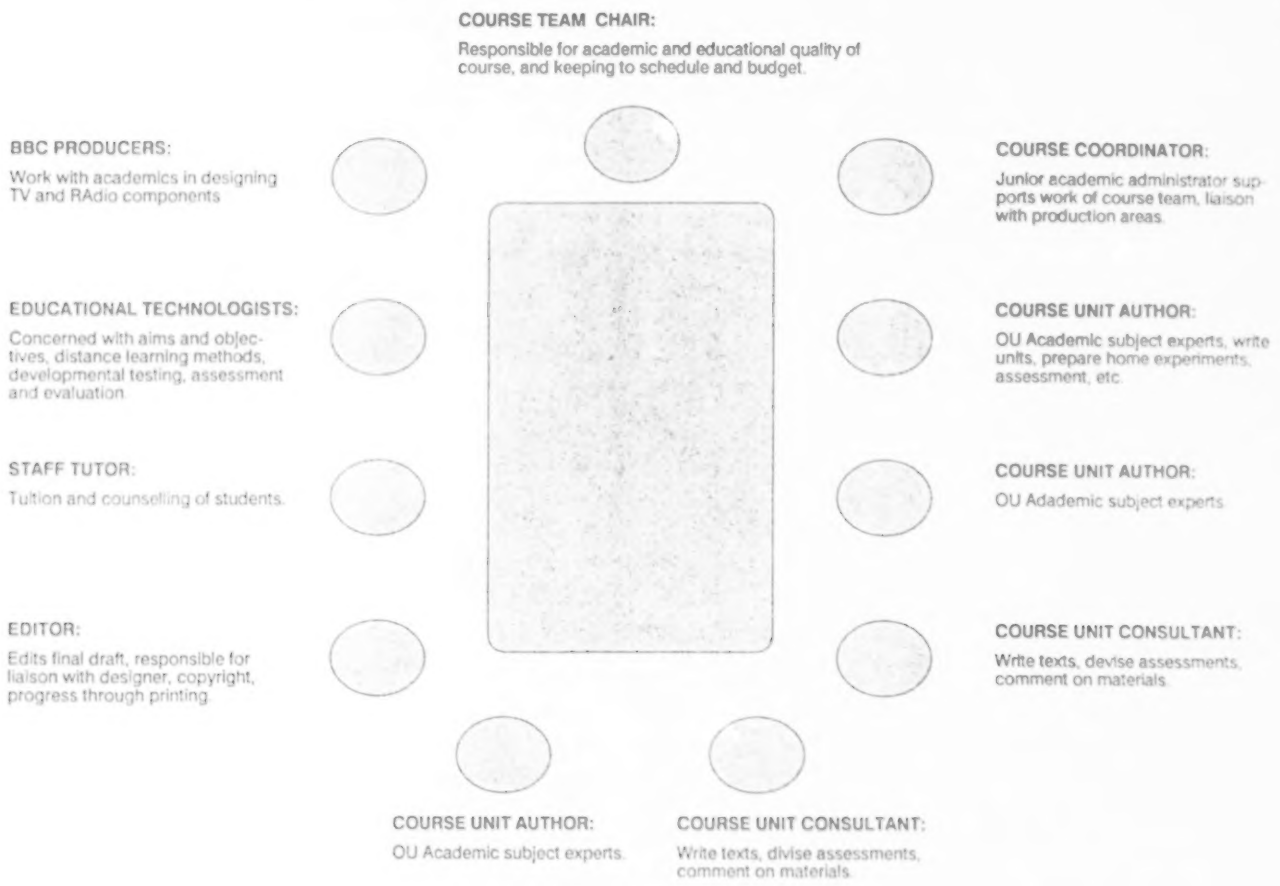
And you may well have a few more people. So if it is a major foundation course that is being produced, the group round the table could well number 30 or 40 people. If it is a higher level course that's only going to go to a relatively small number - and I do mean small number of students, because some of our courses, quite a lot of our courses, have fewer than a hundred students - then the course team will be much smaller and it may actually only comprise three, four, five people.

I would like to make the point that whenever I say anything that sounds fairly definite about the way the Open University does things, there will almost always be exceptions to it.

For choosing the media that is going to be used for the course, the course team makes that decision based on what they see as being necessary for conveying the academic content of the course. And the list on page 94 gives the sorts of details that they have to be able to produce to get the media allocated to that course.

The usual sorts of things - is it going to be a full credit or a half credit? How long is the course likely to last? Originally our courses were planned to last about five years. But if say the average life of an OU course at the moment is 10.7 years and rising, you'll see which direction things are going in.

The programme of study it belongs to and its relationship to other courses. This is actually quite important in terms of a) possible overlap and b) for anyone trying to put together a coherent degree, because people are allowed to choose entirely themselves what combination of courses they put together. We can advise and guide but it's the student's decision.


COURSE TEAM CHAIR:
Responsible for academic and educational quality of course, and keeping to schedule and budget.
BBC PRODUCERS:
Work with academics in designing TV and RAdio components
EDUCATIONAL TECHNOLOGISTS:
Concerned with aims and objectives, distance learning methods, developmental testing, assessment and evaluation.
STAFF TUTOR:
Tuition and counselling of students.
EDITOR:
Edits final draft, responsible for liaison with designer, copyright, progress through printing.
COURSE COORDINATOR:
Junior academic administrator supports work of course team, liaison with production areas.
COURSE UNIT AUTHOR:
OU Academic subject experts, write units, prepare home experiments, assessment, etc.
COURSE UNIT AUTHOR:
OU Adademic subject experts.
COURSE UNIT CONSULTANT:
Write texts, devise assessments, comment on materials.
COURSE UNIT AUTHOR:
OU Academic subject experts.
COURSE UNIT CONSULTANT:
Write texts, divise assessments, comment on materials.

## Course Proposal

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**Course Data**

- Course Title
- Credit Rating
- Year of First Presentation, Estimated Life of Course
- Programme of Study - Place of Course in Academic Plan
- Relationship to Other Courses and External Recognition

**Student Data**

- Forecast Student Numbers, Entry/Exit and Selection
- Prerequisite Courses
- Arrangements for Disabled Students

**Teaching Strategy/Components**

- Tutorial Strategy
- Assessment Strategy
- Residential School
- Computing
- Printed Materials
- Audio Visual Materials
- Home Experiment Kit
- Multiple Use

**Content**

- Aims and Objectives
- Content

**Production**

Course Team - Name, Role, Proportion of Time
Arrangements for Dejvelopmental Testingf
Student Workload (by week and course component)
Remake Pattern

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There is a certain amount of student data that the course team have to think about in terms of likely numbers. When we say entry, exit and selection we don't actually

mean that we would stop anybody studying it. What we'd say is that you need to have this sort of level of knowledge, you need to know about these sorts of things. But when it comes down to it, it's up to the students to decide themselves whether they have the advised entry requirements for taking a particular course. And there are recommended courses for those who decide they don't have the particular knowledge they need to start on it.

Arrangements for disabled students. We have quite a large number of disabled students - not as many as we might have, given that you would expect a very large proportion for a distance teaching university.

And then they have to go into the teaching strategies and components. The aims and objectives of the course and the production arrangements. So the course team has to sort out and think about all these details, and this can be actually prior to doing any writing. They have got to have had it all planned out.

If I could just say, then, a few words about our core material of print. I'm very fond of print. I think it was Chris who pointed out some of the advantages - that it is accessible to most people; it's portable (and the story of studying it on a bus - I sometimes think that is where students do most of their studying, on a bus or a train); it's familiar - that's actually very important. If you've got an unfamiliar technology it acts as a barrier; the students have one more hurdle to get over before they can even start learning. So if it is a familiar channel of communication, that helps ease the learning process. And print is relatively cheap.

Again we are talking about print as if it is one type of thing. But in fact it comes in a wide variety and we use it in a wide variety of different forms. We have course units, which carry the main message and do the main teaching. It is typical that they be bound in separate units. They are attractively designed. When you open them they look interesting. They are all designed to engage students, to draw them in to reading the academic material, working with the content that's there.

But as well as that we have supplementary materials because, as you can imagine, once these are bound, it would be very expensive to change them. So we have a variety of other materials of not such high quality - supplementary materials which carry information which may be changed from year to year. It still has some design input but not as much as the main course materials.

Then we have what are called course readers. This is the way of getting round the lack of access to libraries. This is where special articles, either classics in the field from selected journals or specially written ones, are brought together and published in book form. And when I say published, I mean actually published by commercial publishers. One of the ways of cutting back on costs is that we found that very often commercial publishers are interested in publishing such books, directly equivalent to the edited volumes that many academics get involved in producing anyway. If you

are producing a volume like that for distance learning the publishers know that they are going to sell a set number back to you as the university to use anyway, and then any extra they sell can be profit. So we have actually developed quite a good relationship in that sort of sense which is commercially helpful to them and cuts our costs by getting material that we've put together published by external publishers.

As well as that, we use set reading. These may be text books that are already available that the academics on the course team feel are essential reading for a course. As with any face-to-face course, there are certain set texts that the students must have but we do put a price limit on the amount that a course team is allowed to put in that category (because sometimes they just spend everybody's money as if it were water); so we have a limit there of £25 for any one course that academics are allowed to ask students to spend extra.

So we use a range of styles and formats of print. Now if we look at the page design this is where it changes from being a straight descriptive piece of work to something that actually is much more like a piece of learning material. When we talk about interaction, we're not talking about live interaction with another person in the here and now. We're talking about interacting with the teacher but through the medium of text - that the teacher can interact with the student through the medium of text.

So there will be an introduction, which explains what is going to come in a particular section of the course unit. There may well be orienting questions or quizzes which draw the students in, start them thinking about the topic. There perhaps will be examples of typical replies, so that the students get the feel for the fact that there may be a variety of opinions or attitudes that are held by other people on the topic.

Then there will be perhaps a piece of text which is just straight content followed by a self assessment question, which is designed to help the learners assess whether they've understood the piece of text that they have just read and whether their response was adequate.

They may then go on perhaps to read a case study which relates that content to real life examples - again it depends very much on the subject as to which of these you use and how.

And then there may be another activity and a check list, where the learners apply what they've learned to their own situation. So you can imagine that if it is about teaching reading, the students would be asked to apply it to their own classroom situation.

There will be another piece of text providing necessary content followed by a self assessment question, and so it goes on. There will be a mixture all the time of academic content, questions to the students, open questions asking them to reflect on what they've learned or to apply what they have learned. And this is active learning.

I may say that that's the theory of it. So if you look at university course units, some texts will be somewhat more active than others but we do try to keep educating our staff.

The development of this sort of material is not cheap. So I suppose in terms of balance of costs, we put our efforts, the costs, at the development stage of the course when we are designing it. Once that money has been spent, once the course is designed, then it's there and it can be used in a whole variety of forms. It can be disseminated in a variety of ways.

So we may go through two, normally three draft stages of this to get the text right. And then there is the layout stage, if we are going for a major course unit printing on it. The major problem with this approach is that sometimes it is claimed that it is very difficult to stop academics talking - it's just as difficult to stop them writing. Either it is difficult to get them to start writing, in the first place, because then they don't keep to the development timetable, but once they do start, it's difficult to stop them. So the poor students end up with a much higher degree of workload than they should have. We feel that it is very important to keep a realistic workload on the students, obviously. But some do go over it quite a lot.

In terms of the audio provision, that's the second major component on most courses. If print is the first, audio is the second. Originally, broadcast radio was used on almost all courses. But this is the area of greatest change over the last twenty years. We've experimented and continue to experiment with a whole range of different forms of technology. We've used video disks, computer assisted learning, a form of telewriting, computer conferencing, telephone tutoring. But the greatest change in courses has been in the move from using radio to using audio cassettes. And it's been so phenomenal that out of the 142 courses that we currently offer, 131 of them now use cassettes rather than radio.

There are a number of different reasons for this but, primarily, I would say it is because of the timing - and this is the same with television. We tend to be restricted very much either to the very late evening or very early morning slots, which students do find it difficult to listen to. And if our students do find it difficult to listen to something or to tune in, then we can't make it an essential part of the teaching. The airtime is very limited. The costs are the same for audio cassettes as for radio but for distribution, if you're dealing with smaller courses - in fact, if it's under 500 hundred in Britain - then it's actually cheaper to distribute by post in cassettes than by radio. On the positive side, from the point of view of student convenience, a cassette can be used any time, anywhere. So when you see people - you know, the Walkman society - it might just as well be elements of organic chemistry that they are listening to as number three in the charts. It's got replay facilities; it's got stop/start facilities - you can't do that with the radio.

In terms of teaching effectiveness, it's got two very great strengths. It can be used in either of two directions. You can actually be sitting there as a student with the print material in front of you, with the cassette talking you through it. One student put it, "it's like having a tutor standing at your shoulder". So if you are looking at a complicated table, the cassette actually talks you through it. It says: "Now look at Table 5, look at the third row" and actually explains it to you, as if the tutor's there. It can also help you examine real objects. This very low tech box is actually a package for training of our own staff in using cassettes. It's got a range of examples of different ways of using audio cassettes. And the home experimental kit for geology, for example, consists of a little rock, this cheap plastic viewer and some film slides, as well as the books. But if we are looking at rock like that, a cassette can talk you through it, can show you how to look at it, what you're looking for. And it can also deal with practical procedures. Conversely it can provide you with an oral experience so that what you are listening to on the cassette the print is talking you through. So if you are listening to music, the print can be explaining what you are listening to on the cassette. Or if you are listening to human interaction, discussion, debate, the print can be commenting on what you've listened. So it does have the strength of being able to look at it from both directions.

You could say that in terms of the future video should therefore be taking over from TV. I'm not so sure about this. I think, it's quite possible but it depends on the technology, really. There are still problems with it. Most people have video recorders in their homes now, so that's a great advantage. But the technical quality for teaching purposes isn't always as good as we'd like, particularly when you get things like flutter when you freeze-frame, this sort of thing. So I'm not certain that it will take over, although we use it on an awful lot of our courses, and we do use it in a different way to broadcast TV.

What it does look as if it might happen, if I could just move on to a few final words on the future, is that we use broadcast time as a distribution network rather than as a form of teaching. So we develop the video in a video format as a direct teaching instrument so we are not limited to the 25 minute programme that someone else was talking about that you need for a TV programme. You can have it as long or as short as you want; you can have teaching instructions in print interspersed between them; you can have student activities built in. But that can then be put out over the airways for people to record in their own homes. And it can actually be cheaper to do that than to send it by post in video cassettes. So we are now looking at broadcasting as a form of dissemination rather than as the channel of communication. And that is quite an important step forward.

In other developments that we are likely to be getting in the future, I think we will be concerned more with the way we develop courses. At the moment, Europe is the next big thing happening in 1992. We're already talking about joint development of courses with other distance teaching universities in Europe. There is a project called JANUS which we are carrying out a feasibility study on, which is for a

telecommunications network between campuses, using satellite, so that we can jointly develop courses which can then be disseminated locally by the institutions. So it's not using telecommunications to reach students; it's for communication between staff.

As far as the students are concerned the main changes for them will be of two types. One is in the assessment and qualifications area (I'm sorry I didn't have time to cover that this afternoon). We're growing very rapidly now in terms of recognizing credits of different institutions. Our credits are recognized by all other higher education institutions in Britain and we are now developing a European-wide credit recognition databank. So we are going to get some very interesting developments when we get requests from students in other countries of Europe for our courses. And the other is in the development of home computing. It's very difficult to say what direction that's going in. We've got about four or five courses now which are using home computers. The potential is terrific. But whether it will be realized depends on how fast the computer industry gets itself together to get a common system, so that you don't have this problem of one piece of software not being able to be used on another piece of hardware. And where the students themselves become familiar with the use of home computers, so that you don't have this frozen brain that some people have, myself included, when faced with a piece of new technical equipment. So they need to become familiar with the use of it. But it has been used very successfully in terms of computer conferencing to provide support for students, both by tutors and between students themselves. And the support that students can give to each other is phenomenal and very important in terms of keeping costs down, because we can't keep affording tutor based support.

Thank you very much for the opportunity to tell you about what we are doing.

## Computer-based Learning at Nova University
## by Dr. Barry Centini

I'd like to start off quickly with my background because a lot of people in the field have come through somewhat the same route. I originally got a doctorate in geology and became a Professor at Emory University in Atlanta teaching geology, way back years ago, got involved in the earth science curriculum project, and went into science education. At the time in the early seventies there was a new University in South Florida, Nova University, which was only seven years old. Dr. Abraham Fischler, the President, had just come from Berkeley as one of the leading science educators in the world. I went to work with him and, through that relationship, caught his enthusiasm for innovative things. I became involved in computer-based learning and eventually got a second masters degree, in computer learning - ironically through traditional methods. Many of the programmes that claim innovation and teach innovation do it in very structured, traditional ways.

Recently I saw an opportunity to move back to the north for a while to get out of south Florida. Nova is located in Broward County in Fort Lauderdale, Florida, and I took a job with the U.S. Army working basically out of the Pentagon at what they call the D.A. level, trying to get computers and computer-based learning into the 300 army installations around the world. It's quite a challenge. It's unbelievable, in fact.

The U.S. Army, as you probably recognize, is changing very rapidly - down-sizing. It is moving more towards innovation and actually becoming more automated as it gets smaller. We have a lot of people in Europe; they don't know where they're going and what they're doing in this scenario. So it's fun, it's exciting. I'll be with the Army for four years and have already spent a year and a half. But I still get paid by Nova. It's kind of a crazy arrangement where Nova sends a bill to the army. So I really am not an Army employee.

Nova has a name, sometimes good and sometimes bad, for doing different things. Other presenters have given the spectrum from somewhat traditional perspectives - taking traditional courses and making them available to distance learners through learner centred mechanisms. What Nova is trying to do is probably somewhat more toward the learner centred end. I'm a great believer in mastery learning. One of the tragic flaws in the educational system, in my opinion, is that learning is the variable and time is the constant. If you are going to learn mathematics you have eight weeks, that's it. And at the end of the eighth week you take a test and what you learn is what you learn. Especially in hierarchical courses like mathematics for instance, where one needs to get a skill, I never could understand how one could continue to get Cs and keep taking further courses. Because each course you went into, you didn't know 30% of what you didn't know before, which then compounds the problem. The systems that we've developed for the most part allow some flexibility in timing. We

are structured like any university by the Registrars. In our case in the States there is something unique that we haven't talked too much about, which is licensing and accreditation. We have a god over us called the Southern Association of Colleges and Schools that accredits universities. It's part of a larger, nationwide accreditation system. We would not get one student or iota of aid if we did not pass the SAC's recommended approval. So every five years SAC comes along and we go through this dog and pony show to be sure we do exactly what they recommend. They send a special team, incidentally, to look at our distance learning efforts.

So mastery learning is to me important, and therefore whatever we do we try to build in the notion that there are different times and rates that learners work at. Secondly we try to build in the fact that different learners learn in different ways.

One of the things that impressed me about this conference, compared to some of the others I've been to, is that everybody here is talking about real things on the ground, things that are running. And they've been at it for some time. I heard a story about a demonstration at a conference I was at the other day. A guy died and went to purgatory and was given a choice of heaven and hell, which he thought was interesting. And in fact he could go and sample each place. He says, "great, send me up to heaven". He went up there and it was pretty much what he expected, except that it seemed awfully dull and boring. People were just kind of wandering around; there was no interaction. He went back to purgatory and went down to hell. And it was very much like heaven, except everybody was excited and talking and active. He says, "This is great!". He went back to purgatory and says, "I'll take hell". So, bingo! He's back in hell. Except it's the real hell - the fire and brimstone and labour and pain. He turns to Lucifer and says, "This is not the hell I just saw". And Lucifer says, "That was a demonstration".

Many of the things people talk about is - you're familiar with the term - 'vapourware'. There is a lot of vapourware out there in courseware. And I guess I'm guilty of that sometimes myself, but we have to dream, we have to allow ourselves that. But I think what we do is keep our feet on the ground.

I just finished a paper for the State of South Carolina through a friend of mine who is at the United States Department of Labour, which is very much into distance, distributed, innovative, different ways of learning. They have real problems in our country in training. They're looking at it from the training viewpoint. And so they were commissioned to do this study and I did a paper (I have it with me; it's about 56 pages so I couldn't make a lot of copies. But if you want to give me your name I'll be glad to try send a copy to you). My presentation uses some of the information from this paper.

**The Distance Learning Clientele**

Basically, distance learning serves:

1. Remote students. Those learners in locations (Caribbean Islands, rural Maine, etc.) where access to traditional education is either cost prohibitive of physically impossible.

   Students cut off by distance. I always like to describe what we do as something that cuts the barriers of time and space.

2. Disenfranchised Adult Learners. Those potential students whose job or family commitments make attending traditional schools impractical or impossible.

   These are the ones, for the most part, that we deal with. I directed a doctorate programme in training and learning and to get in the programme you had to have a masters degree in that field. Most of the people who had masters degrees were in their 40's, were married, had families, and had commitments to their job that would not allow them to just stop and go back to university and take three years off to get a doctorate. So they needed some sort of different kind of programme. And Nova in its earlier days started field based programmes and that was a step towards this. So we are talking about the disenfranchised adult learners. And that's a key thing.

3. Exceptional Students. Gifted and talented, under-serviced and disadvantaged students in situations where it is not "cost effective" to offer traditional methods.

   We had a student on-line once, and a friend of mine was analyzing his writing and he realized that he had a lot of writing problems. And he was working for IBM, a very bright, very alert student. But he could not write at all. It turns out when me met him that he was severely hearing impaired, basically he was deaf. And he had not learned writing. And so we started looking into the possibility of addressing these kind of students and there is a tremendous number of those students out there. The U.S. government has put some money into that.

4. Part-time students, workshop/conference participants, community members, government employees. All those potential learners who cannot be in a fixed place for a specific amount of time.

I don't know if this conference could have been done by teleconference. But, you know, I turn up at a conference on innovative ways of communicating and I stand in front of you with classic slides - but that's the way it goes.

**Nova University: General Background**

Just some quick background on Nova University, to put it in perspective. It was founded in 1964 in Broward County, Florida, which is between Palm Beach and Dade County. There were state universities in both of those counties but none in Broward. Broward County now has about 1 1/2 million people. (About seven million people live in south Florida. Most of the population concentration in Florida is in the south). Nova started as a private university from the outset and has been ever since, although we currently get a lot of State aid. It's always rumoured that the State is going to buy us out.

In the early years we only had doctorate programmes. We started at the doctorate level in oceanography and in psychology. You won't last very long in a private institution with only doctorates, so we got involved in other things. And one of the first things we got involved in was field-based learning. Pretty soon we had clusters all over the United States, giving masters and doctorate degrees in education. It gave Nova in some circles a quote unquote "bad name". We talk about being on the leading edge - we use the term "bleeding edge". If you are going to be innovative in any way, you're going to find out two things. One, people are going to beat you up in the beginning; and then they are going to copy you. And today there are more field-based programmes in the U.S. than you can imagine, and most of them are like what we did twelve years ago, and they are still facing the same battles.

Today Nova has about 8,000 students and a budget of about $80 million. It has a law school that is approved by the American Bar Association who, I am not kidding you, comes with a ruler and measures your desks. I mean, they are as traditional and non-innovative as the world can be. Also the American Psychological Association, which has no room for innovation. So the history of Nova has been from non-tradition towards tradition. We have an undergraduate college now with very traditional things and one with non-traditional. Thank heavens, the President for the last eighteen years has been Abe Fischler, who just won't give up. He was the one who got involved with Dr. Lalor to try to establish something which we were calling at the time CARIBNET. The rationale for it was to:

- provide cost-effective education and training to Caribbean citizens;
- increase the number and range of Caribbean citizens receiving U.S. sponsored education and training;
- improve the capacity of the University of the West Indies to provide educational services to the English-speaking Caribbean;
- allow the exchange of academic courses and programmes between U.S. universities and the University of the West Indies;

- enhance the effectiveness of regional organizations and the sharing of resources among Caribbean countries;

- open a channel for continuous, multinational communication between the U.S. and Caribbean nations for the sharing of experts and information.

I think the second to last one might be of most importance. One of the things that impresses me when I listen to two universities in the same province in Canada is that there is interaction, I'm sure, but it's each person doing his own thing. There is a book out in the States called "The Educational Utility", and I think that we have to start thinking that way. We are all using the same sort of drivers, the same technology, but everybody is doing his thing. There is no sharing of resources and I think we have to start going that way soon.

**Nova University and the Caribbean**

We were looking at ourselves as a gateway from Nova to the rest of the United States for the various courses. And so along those lines what we were proposing basically was to do three things:

Video courses - and we went into a lot of details of the engineering of this. It was going to be compressed video, and it will be some day. On-line computer courses, because that is where our expertise is really at.

Long distance conferencing. Again, Nova was hoping to act as the nexus or the node in the States for access to Dialog and other similar facilities.

We thought that the possible impact of CARIBNET would be:

- in-service training programmes for doctors, nurses, teachers, lawyers, and other professionals;

- academic courses between U.S. and Caribbean universities and schools;

- educational programmes by and for specific AID projects;

- medical consultations and back-up support;

- seminars for government officials, labour leaders, journalists, etc.;

- on-call expert support in many fields such as medicine, agriculture, engineering, commerce, etc.;

- access to thousands of U.S. databanks such as the National Library of Medicine, ERIC, etc.;

- administrative, planning and evaluation meetings;

- extension services by U.S. and Caribbean institutions.

Hopefully we can still pull it off.

**Technology-Based Learning Technologies**

In the paper I mentioned at the beginning of my presentation, I looked at many definitions of distance learning. I'm going to read the one from a paper for the National Association of School Boards:

> *"Today, distance learning means the live, simultaneous transmission of instruction from a teacher located at an origination site to students located in one or more distant or 'remote' sites"*

In my paper I take exception to this and say that "live" and "simultaneous" are not necessary to the definition of distance learning and, indeed, there are other ways as we have been hearing. So I think it is important that we take that out.

## Technology-Based Learning Technologies

- **Computer Delivery**
  - Computer-Based Training (CBT)
  - Artificial Intelligence (AI)/Intelligent Computer-Assisted Instruction (ICAI)
  - Hypertext/Hypermedia
  - Embedded Training

- **Conferencing <== Distance Technologies**
  - Synchronous Computer Conferencing (SCC)
  - Asynchronous Computer Conferencing (ACC)
  - One-Way Videoteleconferencing - Broadcast or Cable Station
  - Two-Way Videoteleconferencing

- **Optical Disc Technology**
  - Compact Disc - Read Only Memory (CD-ROM)
  - Digital Video-Interactive (DVI)
  - Compact Disc-Interactive (CDI)
  - Interactive Videodisc (IVD)

On the preceding page is a list of technology-based learning technologies. For a while at Nova we were calling ourselves the Centre for Computer-based Learning, CBL, but it's really technology-based learning. If you want to get down to it, a piece of chalk is technology. Except that is not electronic technology like CBL.

In the States, and I will be very honest with you, classic CAI - the use of a computer to teach students - has not caught on the way everybody thought it was going to. I think there are a lot of faults with it, and my main thesis throughout will be that you need to have a human in the mix somewhere. You cannot possibly ever make software or a machine smart enough to sit and do the kinds of things that a good teacher can do. You can use them as tools but not as an end unto themselves. And so all the money that Apple and McIntosh and IBM have put into placing computers in U.S. schools - when it comes to drill and practice they are wonderful, they're very patient. When it comes to lots of things they work. But they haven't been the answer. I think the problem is that people focus on a particular technology and close their eyes to everything else.

In regard to conferencing, there have been interesting developments. PLATO, developed in the early sixties, was a big name in computers and had terminals all over the United States. Now there is something called NovaNet, not connected to us, where they broadcast from the University of Illinois a signal out to a satellite and down to a box. Around that box there are a bunch of terminals that talk to the box. The box then is telephone-connected back to the University of Illinois. So what goes out to the students, what fills the screens, is satellite-delivered material. What goes back is somebody's input into a computer. You talk about asymmetry, you talk about passive learning - if there's one thing we can be accused of in a lot of computer-based learning is that what students learn is how to turn on the switch on the computer and push a menu. We're very passive, and yet we talk about learning in ways other than just giving facts. I think it is important for us to keep that in mind. A lot of the presentations are asymmetrical, if you will. A lot of data goes out but very little comes back.

As to what we call interactive - I went for instance to a conference at the University of Maine, and I watched them do a calculus course from Oklahoma State University which was broadcast to about forty schools all over the United States, live from 10-11. It was interesting that in the middle of it they cut off and watched a satellite take off and then came back, which impressed me no end. But I asked them if they taped it and allowed the students to look at it later. And they said, "Oh no! It's the live part that's important". But we are talking about three or four hundred students with one 800 'phoneline, calling in occasionally to a professor. The live and simultaneous part kind of lost me there. Once again, I think it's this passive sort of thing - they sit there, they suck up the great man's words (and especially in calculus), then they have to work with a local tutor. Now fortunately or unfortunately, this is done in situations where you can't find a calculus teacher. We also do it in the States for Russian and lots of things where in a rural setting you can't find that kind of teacher. But you have

to hire a tutor to at least look over the class. And so what happens is, again, a lot of great thought coming out but the onus of the learning still falls back on the individual student.

**Distance Learning Technology Matrix**

I'm big on matrices, for some reason. I just love to draw matrices. So lets look at the matrix below.

**Distance Learning Technology Matrix**

| | Audio | Video | Computer |
|---|---|---|---|
| Public Telephone (PTSN) | 1 | - | 2 |
| Digital Telephone/ISDN | 3 | 3 | 3 |
| Broadcast Technologies | 4 | 4 | - |
| Cable | 5 | 5 | 5 |
| ITFS/Microwave | 6 | 6 | - |
| Satellite | 7 | 7 | 7 |

We start with the public telephone system and from there we move to the digital telephone. We're coming on very strong with this, at least in certain parts of the United States. I know there are a lot of us who are not calling ourselves Luddites, but we are sure it will be a while before technology hits us. Until we think back to ten years ago. I remember starting on a little Apple computer with 32K - that was only ten years ago. I think these things will come - broadcast technologies, cable - but digital telephone is definitely on the horizon. Right now in the States a lot of cable stations in local areas use something called the homework hotline, where students can get on-line and if they are taking middle school algebra, for instance, there will be a teacher on there whom they can call and she'll do the question for them. And what they do is get the school system to set the same homework. It's somewhat interactive, and is at least an attempt to use cable for educational purposes. Again, I mention it for what it's worth, in the Washington D.C. area I have 118 channels now, of which 100 are selling me cars and houses; and J.C. Penny's has its own channel now; there are three or four different channels marketing various kinds of things; and about 27 religious stations. I can also get on-line and order movies, and so on. But the potential is there. Cable has tremendous potential. So I think eventually the time will come where, as with the Open University, we'll be able to see a screen full of courses we could take and actually call a number and subscribe to that particular course. Again we're talking about different markets. For example, it may be a while before these technologies reach somewhere like the South Pacific. But in my case I have to know all the ones that are available. Then we have the microwave and the satellite technologies. I think they have been overblown, quite frankly, as far as these

live, interactive satellite transmissions are concerned. They serve their purpose, but I think they are not all that important.

**The System at Nova University**

Let me now give you a quick summary of what we do. We have about 500 students on line taking courses with us, or getting full degree programmes - either doctoral programmes in information science, in training and learning, or business administration; or masters programmes, mostly in training and learning, information science, and so on. We started with the notion that computer-based learning is best for certain disciplines, certain content areas, and so that's what we've been doing. Nova still has a great number of field-based programmes. Kaiser-Aluminum here in Jamaica has a masters degree programme where we fly professors from Florida to Kaiser and they do the teaching on site. We have an entire doctoral programme based all over the United States, and literally all over the world, where every student coming into the programme is required to buy an IBM computer or an IBM compatible (one of the problems we first encountered was compatibility). We use the UNIX operating system. It has a file called termcap that allows us to take a lot of different machines. But we find it easier if we know that people are using a standard computer. These students then get on-line. They take a course in how to use telecommunications; they take a course in using the writer's work bench and how to write correctly; they take a course in statistics on-line; and most importantly they take a course in how to use Dialog and get remote access to databases. We think this is critical, because that's what the accrediting associations keep knocking us with, like everybody else - about our libraries. On-line access to libraries is moving at an incredible rate. It's somewhat expensive now but I hope it will come down. But that gives us, if you will, an out - we can use that. And in any case, many students do use the facility.

So we found the tools that we can use from computing now. Each student has to have a computer and a modem, and has to be able to hook into a telephone line that has a node connected to Tymenet. Now Tymenet packet switching network is worldwide. We have students in West Germany. I do not know they are in West Germany. I have a classic example of a student in Sitka, Alaska, which is five time zones one way, and one in Nova Scotia, which is one time zone the other way. And so I have a six time zone wide audience. We do get on with live, interactive things. I have a classroom of 22 students on live with me, so I have to time it so that the time zones come out right. But this student in Alaska, her name was Evelyn and she taught at a little Baptist college, and she was a librarian. In my mind, I had a picture of Evelyn. And we communicated for three months on-line. And in this particular programme we had regional seminars every three months. And I flew to California and I looked around for Evelyn, and there was no little old lady with a bun, looking like Evelyn, and it turns out that Evelyn was a six foot, black woman. I would never have picked that. That was not the Evelyn I was talking to on-line. And what this taught me was that these sort of modes have no prejudice or prejudgment of

female/male, tall/thin/fat, whatever. You are judging somebody for what they are producing, and only that. And for me it was a very important lesson. Some of these systems will allow that and some won't.

We use electronic mail. Our students get on once they learn to use the computer. It's like any other technology. We're finding side effects to it. Students who never wanted a computer and refused to get one were told, "If you want to do our doctoral programme, you must get a computer". At the end of the course I get these letters that I need to publish some day, praising that forced decision. "How did I ever get along without it?" So I hear from some of you, and I understand what you are saying: "Our students don't have computers". Well of course they don't. They don't have use for computers. But if you give them a use they might. And I know in many cases we're talking economics, we're talking access, we're talking maintenance and the kinds of things to which I am spoiled to a degree coming from South Florida and Virginia area. But for all that we are finding students all over the world getting computers somehow and getting on-line. And in many cases the side effects of what they learn are interesting. We use the UNIX based system to run our stuff. And in the early days before we had some menus our students had to learn more UNIX than they wanted to know. Many of them got promotions in their jobs because of their UNIX knowledge. So there was a side effect. And in fact some of our professors who come on and take courses become better in their own colleges because they are the quote unquote experts in computer-based learning. So it's a snowballing kind of thing, but it has to start somewhere. You have to make some decisions if you are going to be computer-based. So if you don't have a computer, you can't join most of our programmes.

Once you have your own computer, what you do is you get on-line from seven o'clock at night till seven in the morning. Why? Because our rates vary dramatically during the day. On week-ends and holidays you can come on any time you want. So our students can work pretty well when they want and the reason it doesn't bother us is that they can't come on in the middle of the day is that the great majority are working anyway and are not supposed to be on. So that works out fairly well. There are ways to get on during the day, incidentally, and I'm on every day in fact.

Our professors of course are from all over the United States. Many of them are down in Florida but there is no barrier because of location. The system is worldwide. What you have to pay for, if you don't live in an area that has a local node that is directly accessible to your telephone, is the distance from your house to the closest node. I had students in Canada that used Datapak for a while, but now Tymenet is there and there's no problem. So in our case, and again we are talking doctoral and masters and some undergraduate (I'll give you a quick example of that before I get out of here), our students have not found problems of access to be a particular barrier. We have database, writing packages, all the things you would expect. What happens is that once the student logs in she's on a vax 8550 machine sitting in south Florida, and that is what she is operating off. She has her own local database, she

can save, she can log and save files. Students upload their assignments to us and they download their assignments to their local machine. But while they are on-line they are working with the mainframe and they are sending mail.

We're part of a network called Usernet, which is a worldwide connection of UNIX machines. And the amount of material that comes on is unreal. If a student is smart enough he can learn how to start sending messages to any other UNIX machine in the world. But most of our students of course don't get in at that level. They simply use this as a tool. They don't get behind the scenes.

**Nova University Interactivity Enhancement Tools**

Some of the things we had to do to take some of what we had and make them more interactive, more live, more like the conferencing kind of arrangements, are described below.

**Nova University's Enhancement Tools**

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***ECR** -- The "electronic classroom", an interactive learning environment that can accommodate up to 24 students per classroom. Students can take notes, ask questions, take quizzes, conduct surveys, do almost everything possible in a traditional classroom.

* **Electronic Management Tools** -- A whole series of programmes developed for filing student work and keeping track of progress. A system, "electronic student", allows automatic storing and record keeping, with proper student/instructor notification, to be in effect at all times with minimum supervision. A "grader" programme allows instructors with minimum computer expertise to read assignments and make comments, select sections of text for discussion, and mail all their critiques to the student.

***Electronic Curriculum Guides** -- Menus, tutorial drivers, tutorial expert systems, and other student aids have been designed so students can choose the level of "system help involvement" and find the electronic learning style that best fits them.

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For the electronic classroom the screen splits - about two thirds of the screen is the teacher and the bottom third are the students. I would get on a Sunday afternoon from my condominium in Fort Lauderdale in January, and the first thing I would ask

Evelyn is, "How is the weather in Alaska?" And that would start a conversation. These students would be on live on the bottom of the screen.

I would start my lecture, I would draw in files. It is a pretty sophisticated C programme, and in fact we have copyrighted it. It will allow me to actually teach a course. Now the students can take notes. They can just hit a control N and it saves the screen for them. If they have a question, they type control A and a question mark appears by their name for me. I open the screen and then they ask their question. So we correspond. But it's like any other situation where there is one teacher and twenty-two learners - I can only talk to one at a time. But I don't think it is any different from the audio telephone arrangement.

So what we saw was that our real lack was the live interactivity, the simultaneousness that's needed, and we developed this. We have done an innovation on this, where we now have CAI on-line, where you come on and you have a bunch of programmed, written files that you are going to read. And you start reading them. The system checks to see if there is a tutor on-line. If there is, a menu option comes up and asks if you want live help, then type this. And if at that time you say yes, the screen will split and you will talk to a human. And I get back to that, because that is the critical thing for me. If there is not a human in the network somewhere, if it is just a student and his computer, especially if it is a mainframe, you are going to find trouble, I guarantee you. Of course that leads to some problems about how you staff this sort of thing. What you need to do is find a bunch of computer addicts who have nothing else to do, 24 hours a day, seven days a week.

The U.S. Army has committed itself to a strategy called distributed training, where they say by the year 2005 50% of the Army training (I hope not how to shoot a gun) will be done by distance methods, methods other than traditional. And they are committed to it. They have it all worked out, where they are going to save seven billion dollars, incidentally. What they don't have worked out is how they are going to manage this.

**Student Support**

We have heard a lot about pacing, etc. Well, we find that it is not so much keeping up with where the students are, it is more keeping up with where they are as compared to where they should be. It's a different thing. It's very easy to come to the end of the fourteen week period and say, "Well, you didn't do anything, you've flunked". But that is obviously not what education or learning is all about. What we need to have are methods that tell us that a particular student has not logged on in three weeks, and then call them on the telephone - because obviously you can't use the system to contact them if they are not contacting the system. And so we spent several years developing the electronic management tools, tracking records and so on, but also actually staying on top of the students.

When you start having students working at different rates (I've had experience of this in something called IPI, individual progress instruction, in math. And it became an incredible burden, where every student was at a different level on a different day), if you automate the process you need automation that is pro-active, that actually goes after the student and anticipates problems. If you wait for them to occur, you will have a withdrawal rate that is much worse than anything you have seen. Because the students will just give up and they will blame the machine, everybody in the world but themselves. I once gave this long sermon to my students in Pasadena and it seemed to be fairly effective. It was all about if you were taking a course at UCLA on Wednesday nights from 6 - 9, whether you would not go because the kid had to go to soccer practice. You see our students have all kinds of pressures on them, and in their hierarchy learning is down about fourth. They have to learn to somehow discipline themselves so that they can tell their family, "I'm leaving next Wednesday night, I'm going over to X's house to do some work on-line". Just to get away. These are all the sorts of things you need to deal with.

**Liberal Studies Programme -- General Menu**

| | | | |
|---|---|---|---|
| 1 | Nova College Information | 8 | Talk to someone online NOW |
| 2 | Unix/Online Information | 9 | Academic Counselling |
| 3 | Liberal Studies Programme | 10 | Mentor System |
| 4 | Communications Menu | 11 | Online Conference (Seminars) |
| 5 | Mathematics Menu | 12 | Online 'Live' Papers |
| 6 | Core Study Areas | 13 | Student/Faculty Info |
| 7 | Majors | 14 | Bulletin Board Service |
| | | 15 | System-Wide Messages (Msgs) |

And then we have electronic curriculum guides and ways of supporting the students. Let me give a quick example of what we are trying to do in an undergraduate setting, which for me is an interesting concept. On our campus in Fort Lauderdale, Florida, we have built dormitories. We were mostly a commuting school but now we have dormitories. We have about 250 students in a very special programme, which the State is paying for, called the Liberal Studies Programme. The notion is that the

students have a lot of options on how they can get their education - either through computers or by going to class, or a combination of both. Basically the notion is distance learning, except the distance is about 100 yards. In fact we've local area networked and wide area networked the campus, and we use that.

When the student comes in to the system and he gets on-line, these are some of the tools. First he sees the menu on the preceeding page, which basically gives him information about the College, the Programme, and whatever he is in.

I'm going to look at Mathematics, but before I do I just want to highlight 'live' papers in the menu. By that I mean you get on and read the paper and the system says "the author is on-line right now, would you like to talk to him?", and allows the screen to split. Now, if you write a few papers and you are in a journal like this and somebody is reading your paper and they know you are on-line, then this I believe is a tremendous change in the way we think about things. When you get into copyright issues, nobody owns what is on to a computer. People take things and give things all the time on a computer. As long as you have a file open to read they are going to own it. You have a very, very hard time copyrighting things on a computer. If you find out they are using it to make money off of it somewhere else, then you can go after them. But for the most part nobody owns a paper on a computer.

The student then chooses the mathematics menu and this is what he would see.

**Nova College - Liberal Arts Programme - Math Continum**

1. Overview -- Rationale
2. Get Your Status
3. Individual Modules ([1-23]
4. Calendar - Lectures
5. Calendar - Assignments
6. Math/Comp Weekly Calendar
7. Online Tutorials
8. Unscheduled Math Help
9. Information About Students
10. HELP with MENU

p) revious Menu
m)ain Menu

You are working on Module 1, so type g)o to go to work
Input I-10 / c / p / m / g / x to Exit ==> 2
----Progress report for centinib ---- Barry Centini *********
You have completed the following Objective(s):
1-1 1-2
and are ready to work on Objective 1-3:
1-3. To understand place value systems, the importance of base value, and relate this to other systems of numeration.
Type t)preTest / m)ain Menu / p)revious Menu / x Exit ==> p

You will notice at the bottom that it tells him where he is: "You have completed the following objective(s) and are ready to work on...".

Now I think you can begin to appreciate what I was talking about when I mentioned a "humongous" management system. But it is a driver that once in place will work for a lot of different kinds of curriculum that you put through. I like this expert system notion of a driver and a knowledge base. And once you establish a driver, you can stick all kinds of knowledge bases into it. That's what we are hoping for - a sort of generic system.

If he chooses a module, it will tell him about that module, as below.

**Module 1**
**SYSTEMS OF NUMERATION**

**Print Option is OFF -- Type "c" to Change It**

---

1. Syllabus (Prerequisites, Goals, Objectives)
2. Online Pretest
3. Specific Assignments
4. All Resources
5. Answers
6. Online CAI -- Tutorials
7. Submit Assignment
8. Online Postest (Self Assessment)
9. Final Assessment (External)

h)elp available through e mail
i)nteractive "LIVE" help available
c)hange print option from OFF
p)revious Menu
m)ain Menu

Input 1-9 / h / i / c / p / m / e(x)it ==> 4
Working . . . . . .

---

The print option is off, but he can print anything. We have printers. We have a lab set up for these students. Remember we are dealing with students on campus, but the same could apply to students off campus.

Where it says, "i") interactive live help available", what the system did was check to see if any of the tutors were on-line. Then it checked to see if the tutor was involved in helping another student. If not, the math student can get help. Many times this menu will come up and this "i" won't be there. Again, a human in the net. (I'll drive you crazy with that.)

The part that is really exciting to me and some day I would love to see it carried further is that the student could then check to see what learning resources are available. And knowing that students learn differently, the system comes up with the following.

**Learning Resource Matrix (LRM) for Module 1**

| | **Individual** | **Small Group** | **Large Group** | **Network(s)** |
|---|---|---|---|---|
| Traditional | Self-Tutoring (1) | Seminar/ Lab (2) | Lecture (3) | Library (N) |
| Analog | Self-View (5) | TV/Film (6) | TV/Film (7) | TeleConf (8) |
| Digital | CAI (N) | Online Conf (10) | ECR (N) | Dialog-CDROM (N) |
| Intelligent Systems | InterVideo (13) | Games/ Simul (N) | Dig/Vid Conf (N) | Internet (N) |

(N) NOT available .... Print Option is 'OFF' At Present - Type c to Change

Type number in ( ) / c)hange Print / p)revious Menu / m)ain Menu / x Exit ==>3

What this says for instance is that there is a paper-based, self tutoring package. If you choose (3), you will be told when the lectures are being given. I used to give the lectures. We would video tape them and make the video tapes available. So if the student chose (3) and found out that the lecture for that module had already been given and won't be given again until September, then he/she goes to (7) and gets the video tape. The system knows what's available and for example puts an (N) to signify that there is no CAI package right now for this module.

What I find of interest is that if I let a student get on this and choose by himself or herself for a while, I can learn their learning styles. I can see whether they consistently show up at lectures, and so on. If the student never chooses (3), if I have not seen him/her in six weeks and we realize that he/she has not completed module 1, section 1 - although we would never let it go that far - we could get in touch with the student and say, "We'll make you a deal, you flunk the course or you come to lectures". We probably made a mistake in the beginning by allowing them the choice.

We should have let them attend lectures until we felt they had wings; because we are dealing with 18 year old freshmen and this is a real problem. I wish I could have done this with adults but the setting was not exactly right.

So I get back to the notion that there has to be a matrix. So that when I find somebody in the Army who loves Plato and they won't have anything to do with the interactive video disc system, I know I have problems. People get on a technology and they ride it to death. And that seems to be the only way they can learn. And they will find enough reasons to stick with that one technology. Now you can argue that I am sticking with computers, and of course I am, but I am using it, to my mind at least, as a management tool only. Right now it's great for electronic mail, but there are so many other things that you can use it for that it can form the base of what you are doing.

**Basic Needs of Computer-Based Systems**

A look at some of the needs of a computer-based system is given on the following page. Regarding the basic needs, first of all if you have a computer-based system you need quick and direct response to student questions. When I was doing my doctorate, if I turned in a paper and went to my professor a week later and said, "It's been a week, please, sir, give me my paper back" he would have looked at me strangely. Our students turn in a paper at 10 o'clock and at midnight they are on-line asking for it. What I'm saying is that the medium is the message, maybe, but we are creating bad expectations. In the beginning we were very active with these students because we wanted them all to be happy and we sent responses back immediately. And so it got to be obsessive. I'll tell you this - the one great disadvantage is that I'm down here now grading papers. This thing is 24 hours a day, seven days a week, 365 days a year. There are no vacations. It's on all the time. Except they can't get on during the day. The second thing is sometimes papers come in in clusters. Basically, you've got to have a human in the network and he or she has to be able to respond to the students.

You need to have continuous communication. If the system is down - and if you've got a system based on a mainframe you will always have it go down at some time - you have to be conscious of that and how it affects the students.

You have to be able to adjust assignments and requirements sometimes to fit the situation. I think that is true for all methods. You have to be somewhat modular.

**Lessons Learned**

What about some of the lessons learned? The number one lesson is that on line learning does not work for all students. And it never will. But neither will any of the other methods. There is no panacea out there for all students. And for those

students for whom it does not work you have to have alternatives. What we try to do is reduce the dependency on the on-line part.

The UNIX environment, which is what we chose, is probably one of the better for multi-users. Our students, incidentally, mostly have DOS computers at home, and then there is the telecommunications package that then hooks into our UNIX environment. You have to be able to have some pretty good programmers to modify it to make it fit the needs of students and to do the sort of programmes we develop.

**Basic Needs of Computer-Based Systems**

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- **Quick and Direct Response to Student Questions**
  - online tutorials
  - online CAI
  - graduate assistant tutors
  - online "student help" database
  - electronic mail response
  - live interactive response
- **Continuous Communication between Students/Faculty**
  - system must be "up" and responsive
  - automatic response system must be available
  - continuing updates on "dailynews" must occur
- **Ability to Adjust Assignments & Requirements Promptly when Necessary**
  - assignments must be modular
  - core assignments with options are necessary

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The faculty must have both traditional classroom skills and computer competencies. When I am on this interactive screen I must be articulate. I've got to be a good typist, incidentally. And that's a problem. Not all our professors are as articulate with their fingers as they are with their mouths. And it is the same with the students. I don't know a way around that until we get around to voice recognition. But you must have traditional classroom skills, and I think this would probably hold for everybody here. For the most part you will not find a poor traditional teacher who is great on-line.

Live interaction with the student is essential. You have to have live people talking to students on a fairly regular basis. If you just let the machines sit there and talk to the student, I guarantee you're going to lose them - at least in our experience it has been that way.

And then the development of expert systems to facilitate classroom management and provide prompt response to students is very necessary.

My final notion is an appeal - and I don't know who I am appealing to - for a consortium of effort, for an educational utility. The notion of an educational utility is just that. Just as you have the telecommunication company and the light and power company, there should be an educational utility in the United States that all colleges could use. There was a little company in San Francisco, (I'm not sure if they are still in business) that called themselves the Electronic University. They would broker for colleges to do this. Except that they didn't have the live part. They would simply provide the courseware. We need a broker wherever possible to take their strengths and experiences and apply to our courses.

## Issues and Problems Identified in the Presentations
## by Dr. Dennis Irvine

After two hectic days in which we have been bombarded with masses of information, we would be justified in taking the line that we had feasted well, and in this balmy weather a quiet siesta, preferably by the sea, would be a fitting conclusion to this conference. I certainly would have welcomed any excuse to escape the task of trying to pull together the conglomeration of experiences, comments and views in what the programme euphemistically describes as a 'review of presentations', not least because I had to be undertaking it against the background of the usual Sunday night feature of the Pegasus Hotel, a loud, though not unpleasant, cacophony of calypso and reggae music, cheerfully welcomed at any other time but, to say the least, mildly distracting for one trying to pick his way through a veritable minefield of expert testimony.

Unhappily, for you and for me, there is still a job to be done. We came here, if I may quote from the programme,

i) to share experiences of various institutions of distance teaching and explore mechanisms which are likely to enhance the quality of distance education

ii) to familiarize a cross-section of the Caribbean community to different aspects of distance teaching, such as:

- programme planning and design, including assessment of students at a distance
- distance teaching technologies

iii) to provide information to help the UWI community to assess the atmosphere and trends for the proposed expansion of the network and further development of distance teaching.

Let me at this point declare that from a COL perspective, while this conference was targeted at the special concerns of UWI, it was our expectation that the outcomes would have general relevance to countries and regions in the Commonwealth equally faced with the task of applying appropriately the potential of distance education to the resolution of the problems of expanded access to education and, more particularly, to human resource development.

I would be failing both in courtesy and gratitude if I did not express my appreciation of the excellent informative and useful presentations of the several resource persons who have generously shared with us their valuable experiences with the kind of candour and openness which reinforces my conviction that, notwithstanding the

obstacles of the particular biases and entrenched positions of the echelons of bureaucratic and political power, at the level of people represented at this conference the premise of goodwill and cooperation in the context of the Commonwealth on which The Commonwealth of Learning was founded is very much alive and well.

I do not think of the presentation which I am making this morning as a review of the rich and vast store of material of which we were fortunate to be the beneficiaries. All of this has been captured on tape and will be the basis of the proceedings of this conference which in God's, if not Jamaica's and COL's good time, will be available in the not too far future. In a way what I hope I shall be able to do is to help to round off what has been for me, as I am sure for all of you, an informative experience, by extracting from the vast mass of information received some of the more significant issues and problems the information has unveiled, and in respect of which some discussion is still very much outstanding, if UWI and others like it are to be helped in making the appropriate choices to incorporate distance education into their delivery system.

Let me then turn to some of the issues and problems as I perceive them, and since I am far from infallible may I invite you in the discussion not to assume that I covered the ground but to feel free to rectify any inadvertent omission on my part.

1. It is useful to begin with the statement by Professor Lalor in his presentation that "the potential of UWIDITE has only just been scratched" and to ask the following sets of questions:

(a) Is this an inevitable consequence of the kind of environment of institutions like UWI? Is failure to realize the potential of UWIDITE a problem of access to the necessary technology? We have heard that distance education is at the mercy of telecom monopolies. What can be done about this? It is certainly true as one presenter pointed out that individual negotiators are at a disadvantage. But what about a consortium of negotiators and is there a role here for COL?

(b) What other factors act as constraints to the realization of teleconferencing's potential in particular and distance education techniques/ technologies in general? Unwillingness to use the media? Lack of good programmes? Lack of trained personnel?

(c) How does one set about tackling these constraints? What are the specific (as opposed to generalized) problems? We have heard for instance that teleconference course design differs from normal course design, and we have seen one example of a model of the former which is used in the University of Otago. Can we explore how appropriate such a model is for UWI, and if it is how to implement it?

2. What role is best played by teleconferencing in circumstances such as UWI (or USP for that matter)? For lecturing? Student support? Administration? Continuing education through workshops and seminars? If all are valid uses, what balance between them?

   How can teleconferencing be used optimally? By responding to community needs? Doing what conventional higher education institutions do not normally do? Or expanding access? How does one decide which courses are offered by teleconferencing, or for that matter by any distance learning technique?

3. What combination of technologies are desirable and possible given a background not only of limited financial but also technical resources? The latter is often overlooked when systems are being put in place, but repair and maintenance of hardware and recurrent expenditure on software have to be regarded as significant problems in most third world countries.

4. What of the ethical issue which was raised by one presenter? There is the danger, as pointed out, that teleconferencing or any advanced distance learning technology, far from bridging the distance as it should might simply extend the gap. Is this not the case with most technological innovations? How can the effects be mitigated in the case of distance education? In the case of teleconferencing is taping a solution? But then what of copyright issues? Is there a case for retaining the emphasis on print material as "stand alone", as practised say by the University of Waterloo?

5. There have been many references to institutional and Faculty (Staff) resistance to distance teaching. How can this be overcome? How does one rid diehards of the bias against distance education and, more importantly, of the conviction of its inferiority to face-to-face instruction? Is the scheme adopted by Laurentian, namely treating distance education material as refereed publication, worth considering? Likely to be acceptable elsewhere? How about the Waterloo model with a common instructor for on-campus and distance courses? What are the implications of such an arrangement in a UWI context for instance?

6. What is the most appropriate organizational arrangement for distance teaching in a dual mode institution? It appears that quite a few institutions have a Centre/ Department of Continuing Education/Extension Services with responsibility for distance education and a specific budget for the purpose. We have heard of at least one example where the teleconferencing facility is independent of the Faculty and indeed receives substantial support from external subscribers. Is this a model for UWI? Is community support a feasible proposition? What are the chief disadvantages of a Faculty-run teleconferencing facility?

7. Turning to course design, how important is quality control of the type practised by Laurentian University? How feasible elsewhere, bearing in mind the resistance it met initially? Not much was said about cost in regard to development of course materials, but what are the experiences of small institutions like USP and the University of Otago for instance? How many courses have they been able to develop over the period of existence of distance teaching? To what extent was existing course material from elsewhere used in the development of local material? With what success?

8. Accepting that there exists a dichotomy between institution-centred and learner-centred concepts of distance education, which should be the focus? If the latter, does this not imply emphasis on self-instructional materials (c.f. Open University, University of Waterloo, Laurentian)? How valuable then is teleconferencing on its own as a distance teaching technique? Do the advantages outweigh the disadvantages? In this regard how much difficulty is presented by the inflexibility of real time communication?

9. Student support services have been mentioned on different occasions, but it does not seem that their critical importance has been sufficiently stressed. What degree of criticalness would one ascribe to counselling? Tutoring? Assignments and feedback? In the case of the latter how critical is the turn around time for feedback? The University of Waterloo operates on roughly a 6-day turn around. Is this possible elsewhere? Is it necessary? What is the limit? How essential is a period in residence for distance education students? What is the minimum length? What of access to library facilities? What alternatives are there? Is there a lesson from the O.U.'s experience with course readers?

10. What of the clientele for distance learning? Who should have priority among the following:

    - remote students, i.e. learners where access to traditional education is cost prohibitive or physically impossible?
    - disenfranchised adult learners?
    - exceptional students?
    - part-time students, community members, government employees?
    - professionals in need of updating?

11. When should attrition/withdrawal become a matter of concern (NB 30% at U of Waterloo is regarded as normal). How does attrition rate in distance education compare with attrition rate in conventional part-time study? What is the attrition rate for print only as compared with multi-media?

12. We have heard that computer-based learning offers immense possibilities as the experience of the U.S. Army / Nova University shows. However the real question is how much is actually possible, in say UWI, at the present time, bearing in mind all the constraints of technical capability for repair and maintenance, difficulty of obtaining spare parts, uncertainty of electrical supply, etc? What is the best point of entry in CBL for third world countries? What types of application are feasible and cost effective? The observation has been made that Computer Aided Instruction (CAI) has not caught on in the States? What are the reasons for this and what lessons does this have for the countries interested in CAI? Why is CBL preferred to CAI? What are the relative advantages and disadvantages?

## CONCLUSION

The presentations and the discussions which they generated during the three-day conference served to focus attention on areas of debate and concern for distance education in general, and in the development and expansion of the UWIDITE network in particular. The more general issues were outlined by Dr. Irvine in his summary of issues and problems identified in the presentations.

Many of the questions raised by Dr. Irvine were left unanswered. There was simply not enough time for the kind of in-depth discussion they required. However, one of the positive outcomes of the conference was the undertaking given by the presenters, to continue the debate on the issues 'at a distance'. At the same time the questions themselves serve a useful purpose, for they are the starting point for the University of the West Indies in coming to grips with how and in what form distance education should be expanded in the institution. Answers to many of the questions are answers which the University itself will have to provide, and they will often be unique answers which take account of the special circumstances and environment in which the University finds itself. If there is one lesson to be learned from the presentations, it is that there is no single blueprint for the way in which distance education is incorporated, managed, and used in an institution.

Nevertheless, in the limited time available for discussion participants were able to identify some particular concerns in regard to the development and expansion of UWIDITE:

1. Expansion of offerings to include full degree programmes, and the implications for programme design, packaging and administration.

2. The need to establish mechanisms to systematically deal with programme development, faculty development and management.

3. Assessment of distance learning students to maintain parity with assessment of on-campus students, while taking into consideration at the same time the constraints imposed by time and distance (eg. in the return of marked assignments to students).

4. The use of continuous assessment for formative and summative evaluation of the course as well as the student.

5. The interface between the technology and the user, and the need to assess new technologies as they become available for their potential use in a given context.

6. The 'opening up' of UWIDITE to use by a wider constituency for the support or delivery of courses not necessarily related to the University.

A measure of the success of any conference is the extent to which expected outcomes are met. All three aims of the conference were achieved. Links between UWI and the institutions represented at the conference were forged or strengthened, and the University acquired a wealth of useful information to digest, analyze, and bring to bear on the planning and organization of its distance teaching programmes.

A commitment by the presenters to continue the debate of issues brought out at the conference could see the beginning of a useful network of institutions spanning both developed and developing countries of the Commonwealth. Finally the publication of this report is itself a tangible manifestation of the conference's success.

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